THE IRON TRADE REVIEW

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NEW RECORDS

BEING MADE BY FURNACES AND MILLS,

But Deliveries Do Not Satisfy Customers—Pig Iron Firm and Prices Tending Upward.

In spite of the tremendous production of furnaces and mills of the Steel Corporation and independent interests, all companies are now having great difficulty in making deliveries satisfactory to consumers. Based on figures of activities so far this month, it is certain that the Steel Corporation will set a new record for ore shipments, will break its pig iron production record by between 50,000 and 100,000 tons, and will show total shipments of finished materials of well over 900,000 tons, a figure near normal. All subsidiaries show a marked increase in output so far this month, particularly in pig iron and billets. The billet mill at Gary has been started running on forging billets, and the Gary rail mill will turn out 40,000 tons this month. The Corporation now has 92.25 per cent of its blast furnace capacity in operation, not including the Neville stack just blown in. The Columbus No. 1, Niles and Edith, have been ordered in, and Columbus No. 2 will also start soon. This will leave only Steubenville and Zanesville stacks of the Carnegie company idle.

Structural Material

The principal sales of structural material during the past week were made through Chicago offices, which took orders amounting to about 11,000 tons. Fabricating prices are advancing. The 26,000 tons of plates and shapes required for the battleships Wyoming and Arkansas will be furnished by the Carnegie Steel Co. Cast iron pipe orders of the week include 6,000 tons for New Bedford, Mass., and 4,450 tons for Richmond borough, New York City.

Pig Iron Is Strong

In the pig iron market interest centers in many inquiries and some sales made for the first half of next year, including large blocks of basic in eastern territory for first quarter and half at $18, delivered, but furnaces are cautious about committing themselves after Jan. 1. In the south, only two or three furnaces are willing to give quotations for delivery next year. In the Pittsburg district, Bessemer has advanced to $16.50, valley. The reduction of the tariff on pig iron will result in sharp curtailment of sales of American iron on the Pacific coast, where even before the passage of the new tariff bill foreign countries enjoyed a large part of the business. Eastern importers are keeping in daily cable communication with their British representatives in regard to the importing of iron, but prices in Great Britain are advancing at about the same rate as in this country, and there is little likelihood of any considerable tonnage being brought into this country, except to Pacific coast ports. Some large sales of ferro-manganese at high prices are announced. Throughout the country, pig iron prices are firm with a tendency to advance.

DAILY EDITION OF THE IRON TRADE REVIEW.

Believing that a weekly journal does not fully meet the present demands of the iron, steel and allied industries, the Penton Publishing Co. will, on Thursday, Sept. 2, begin the publication of a daily edition of THE IRON TRADE REVIEW, which will be published every business day of the year, except Wednesday, the day on which the weekly edition of THE IRON TRADE REVIEW is printed, and also excepting Saturday, which is a half holiday in many offices.

Leading features of the daily edition will be latest developments in iron, steel and non-ferrous metal markets and news of the Great Lakes affecting the iron ore interests. Special attention will be given to orders for railroad equipment and other matters of importance to the industrial world.

Sheets and Tin Plate.

Sheet tonnage entered by the leading interest for the present month promises to exceed by fully 20 per cent any August in the company's history. Independent interests are also enjoying great prosperity and are operating about 90 per cent of their capacity. The American Sheet & Tin Plate Co. is operating 80 per cent of its sheet mill capacity and 63 per cent of its tin plate capacity.

Steel Rail Orders

The orders for steel rails referred to last week, which were placed immediately following the opening of the books by the Steel Corporation for 1910 delivery, were 145,000 tons for the Santa Fe, and 60,000 tons for the Chicago & Northwestern. The Rock Island, Pennsylvania, Harriman lines and New York Central, are all negotiating for next year's rail requirements, which will be heavy. southern railway has bought 28,000 tons for early rolling at the Ensley mill of the Tennessee company and 12,000 tons from the Pennsylvania Steel Co. The latter company reports large billet sales.

Coke Is Stronger

Following the purchase of coke by the United States Steel Corporation, 25,000 tons per month for the remainder of the year, increased demand from other sources, and continued labor shortage in the Connellsville region, prices are tending upward. A number of furnaces have been sounding the market for their first half requirements, and there is also some inquiry for furnace coke for the remainder of this year.

THE WEEK IN IRON CENTERS

PITTSBURG.

Manufacturers Slow to Take Orders for Future Delivery.

Office of THE IRON TRADE REVIEW,
510 Park Building, Aug. 24.

Anticipation of a sustained improvement in industrial and general business conditions is reflected in the increasing efforts of buyers to get under cover for their extended future requirements of iron and steel materials. The inquiry by consumers for various products for delivery over the first half of the year is growing weekly and where makers are willing to commit themselves on prices, the buying movement has started off very favorably. The great majority of sellers, however, are not inclined at this time to contract ahead against their outputs, desiring to wait until future conditions are more clearly foreshadowed.

The only market for next year that has been definitely opened has been that of rails, in which the prices of $28 on Bessemer and $30 on open-hearth rails, have been affirmed. The desire of western roads to enter their reservations for 1910 has been largely instrumental in bringing makers to this step. In tin plate, though the inquiry is strong, no actual or official move has been taken toward fixing next year's prices, and none will likely be taken for a number of weeks owing to the earliness of the season. The interest among consumers in pig iron and coke is becoming more insistent and considerable selling has been done, principally in iron, although these markets are not yet fairly established. Coke prices especially are still under contemplation, as first half transactions have been largely subject to sliding scale or special arrangements. The reluctance of the makers of bars, shapes and plates to enter contracts running more than a few months ahead is discouraging any attempts of buyers to make any speculative purchases beyond the end of the present year.

The general market situation continues one of heavy ordering, fuller mill and furnace operations and a gradual extension of deliveries in the more active lines. The freight car supply is concerning iron and steel makers more seriously, and the belief is being widely entertained that a shortage of equipment will likely have to be met in the fall or winter months.

Iron Ore.—A sharp buying movement of ore has spread over the past ten days and a large number of furnaces have come into the market for their partial requirements over the remainder of the present year. One large ore-holding interest has sold about 200,000 tons of various grades during that period, which has brought its total sales this season up to about 600,000 tons. As a consequence, it is now sold up with the exception of some unimportant operations. An apparently significant feature of the movement has been the large number of furnaces participating, as the tonnages sold individual buyers were comparatively small. Full regular prices were obtained.

Pig Iron.—Greater selling activity is in evidence in pig iron and round tonnages are being put under contract. Much interest is being shown in next year's deliveries, as the inquiry for the extended future is considerable. An increasing volume of transactions is more definitely indicating the range of prices for such shipment, but many furnaces are not willing to commit themselves beyond this year. There are some soft spots in the situation that are attracting attention, although the general movement appears clearly upward.

Important selling of steel-making iron has continued. The Youngstown Sheet & Tube Co. has bought 15,000 tons of Bessemer for last half shipment at $16.50 valley from the Bessemer Pig Iron Association. A local foundry took 1,000 tons of Bessemer for first half at $17 valley and another Pittsburg foundry has an inquiry out for 1,500 tons of this grade for the same delivery. Other inquiries are pending. The recent selling of basic for last half to a large Pittsburg steel company by Mahoning valley interests has been at $15.25, furnace, which fairly represents the present minimum of the market, although some furnaces are holding for higher prices. A lot of 1,000 tons for immediate shipment was taken by a steel company from a middleman because of price inducement, the quotation being close to $15 valley. The large Standard Steel Car Co. inquiry is still under negotiation.

Foundry iron has been selling quite freely and much of this activity has not been apparent in the open market, but has been quietly conducted between buyers and sellers. A Pittsburg melter closed this week for 4,000 tons of No. 2 and 1,000 tons of No. 3 for first half shipment, paying $16.50 valley for the No. 2. Another melter in this district has an inquiry out for from 4,000 to 6,000 tons of No. 2 for delivery over last quarter and first half. Some interests desirous of booking tonnage have been offering first half No. 2 foundry at $16 valley or less and other deliveries in accordance. Others are holding for $17 for first half. The spot market is fairly firm at $15.50 valley at which some furnaces are selling for shipment this year.

On spot and third quarter shipment on northern iron we quote as follows:

Bessemer, valley	$16.50
Bessemer, Pittsburg	17.40
No. 2 foundry, Pittsburg	16.40 to 16.65
Gray forge, Pittsburg	15.00 to 15.40
Basic, valley	15.25 to 15.50
Basic, Pittsburg	16.15 to 16.40

Ferro-Alloys.—The situation in ferro-manganese is more promising from the seller's standpoint and recent sales for this year have been made at $42, Baltimore, with duty paid, which registers a slight advance. More inquiry for next year's delivery is appearing and two consumers in this district are in the market for 400 tons for first half. A carload sale for next year at $45, Baltimore, is reported. Fifty per cent ferro-silicon has been well established around $65, Pittsburg, but there is considerable range in the quotations on this product. Some sellers of the lower grades of ferro-silicon are still aggressive for business and are naming prices in accordance.

We quote ferro-manganese at from $41.50 to $42, Baltimore, prompt shipment, or for delivery this year and the first half of 1910, $42.50 to $43.50 Baltimore. The freight from Baltimore to Pittsburg is $1.95.

Fifty per cent ferro-silicon is quoted at $65 to $66, Pittsburg; domestic, 12 per cent, $26; 11 per cent, $25; 10 per cent, $24, Pittsburg.

Plates.—The hull material, including the protective deck plating amounting to about 26,000 tons for the new battleships Wyoming and Arkansas, bids for which have just been opened, will be supplied by the Carnegie Steel Co. The ships will be built by the William Cramp & Sons Ship & Engine Building Co. and the New York Ship Building Co. The 13,000 tons of armor plate will be divided between the Carnegie Steel Co., Bethlehem Steel Co. and Midvale Steel Co. Recent car buying includes the award of 2,600 box cars and 1,000 steel cars by the New York Central lines to the American Car & Foundry Co., and 400 box cars by the Union Railroad Co. to the Pressed Steel Car Co. The steel material for all these cars will be furnished by the Carnegie Steel Co. The Harriman lines are figuring on 900 box cars. Plate conditions are very strong, as the mills are so well filled that quick deliveries are hard to obtain. With some interests shipments are running up to eight weeks. There

is a very fair amount of small business being entered. Prices are very firm at 1.40c, Pittsburg, minimum. We quote the present market as follows:

Tank plates, ¼-inch thick, 6¼ to 100 inches, 1.40c to 1.45c, mill. Extras are as follows, per 100 pounds: Boiler and flange steel plate, 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.20c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches, up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½-inch to and including 3/16-inch plate on thin edge, 0.10c; under 3/16 to and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—At the present rate of specifications and orders, the sheet tonnage entered by the American Sheet & Tin Plate Co. during the current month bids fair to exceed by fully 20 per cent any August in the company's history. Orders received by this interest last week were the heaviest of any week in the past two and one-half years. This favorable record of the largest producer is being duplicated in the cases of the independent companies, the mills of which are running very full or at about 90 per cent of total capacity. Higher prices are looked for as deliveries are backward and the present market is firm in quotations. The Youngstown Sheet & Tube Co. this week is running all six of its sheet mills which have been involved in an open shop strike with the Amalgamated Association of Iron, Steel and Tin Workers. The American Sheet & Tin Plate Co.'s operations have not changed, being 142 mills or 80 per cent of its active capacity. We quote present sheet prices as follows:

Blue annealed sheets, Nos. 10 and heavier, 1.60c; Nos. 11 and 12, 1.65c; Nos. 13 and 14, 1.70c; Nos. 15 and 16, 1.80c; box annealed sheets, Nos. 10 to 12, 1.85c; Nos. 13 and 14, 1.90c; Nos. 15 and 16, 1.95c; Nos. 17 to 21, 2c; Nos. 22 to 24, 2.05c; Nos. 25 and 26, 2.10c; No. 27, 2.15c; No. 28, 2.20c; No. 29, 2.25c; No. 30, 2.35c; galvanized sheets, Nos. 13 and 14, 2.25c; Nos. 15 and 16, 2.40c; Nos. 17 to 21, 2.50c; Nos. 22 to 24, 2.65c; Nos. 25 and 26 2.85c; No. 27, 3.05c; No. 28, 3.25c; No. 29, 3.40c; No. 30, 3.65c; painted roofing sheets, $1.55 per square for No. 28 gage, 2½-inch corrugation, and galvanized roofing sheets, $2.80 per square for No. 28 gage, 2½-inch corrugation.

Tin Plate.—While there is considerable inquiry by tin plate consumers for next year's requirements, nothing definite or official has been done in the way of fixing prices, and current reports on this future market are wholly speculative. Ordinarily, prices for the succeeding year are not settled upon at such an early date as the present, although interest in such extended shipment has been stimulated by the sold-up condition of makers who are practically booked to capacity over the remainder of the year. This has led some independents to advance prices up to $5 a box as previously reported. A very fair new business is being done for the summer season. The largest maker this week is running 140 mills, or 63 per cent of serviceable capacity, a gain of three mills over the preceding week. It reports its production is much more satisfactory. The 16 active independent plants are working at about 90 per cent of total mills. We quote the present market as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.40 to $3.65 f. o. b. mill, Pittsburg district. Terms 30 days, less 2 per cent for cash in 10 days.

Rails and Track Material.—The opening of the market on standard rails for next year's delivery has been brought about largely by the desire of western roads to make reservations at this time. It is expected that this action will be followed shortly by similar interest among the roads which buy in Pittsburg and eastern territory, and which are now making estimates of their requirements for next year. The present prices of $28 mill on Bessemer and $30 mill on open-hearth rails will prevail during 1910. The light rail market is advancing and higher prices are being obtained by makers than at any time in the past two years. The Carnegie Steel Co.'s bookings the past week were about 2,500 tons. Track fastenings continue in very heavy demand. An advance of 5 cents per 100 pounds in spikes was posted the past week. There have been some large inquiries out for standard spikes, principal among which is that of the Southern railroad for 20,000 kegs to cover its requirements for some time ahead. We quote the market on Bessemer rails as follows, the base price for open-hearth rails being $30 mill:

Fifty-pound and heavier, 500-ton and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; light rails, 8-pound, $31; 12-pound, $30; 16 to 25-pound, $29; 30 to 35-pound, $28.75; 40 to 45-pound, $28; angle splice bars for standard sections, 1.50c, Pittsburg; standard spikes, 1.70c to 1.75c, Pittsburg; hand spikes, 1.75c to 1.85c, Pittsburg.

Steel.—The free supply of semi-finished steel is becoming more restricted and consumers are having greater difficulty in covering for their needs. Some of the mills continue to decline to dispose of steel in which they have not specialized during the past in selling in the open market, one interest having refused to quote on about 10,000 tons last week. Sheet bars are scarce and tonnages were sold the past week on the basis of $26.50, Pittsburg, while some makers are now asking $27. Billets are very strong and forging billets are held as high as $30, Pittsburg. The American Sheet & Tin Plate Co., by reason of its increased operations, is specifying more heavily for sheet bars with the Carnegie Steel Co. Considerable inquiry for foreign steel is still coming out, but no selling of note has been ascertained.

Bessemer 4 x 4 billets with 0.25 carbon and less are regularly quoted at $24.50 to $25.50, Pittsburg, with the usual extras for size and analysis, and open-hearth rolling billets from $26 to $27, Pittsburg. Forging billets are held at $28 to $30, Pittsburg. Sheet and tin bars are quoted at $26.50 to $27, Pittsburg.

Hoops and Bands.—Continued improvement is noted in hoops, which until recently have been lagging behind other finished lines. The large buyers are beginning to enter the market more freely and the miscellaneous sources of consumption are giving the market good support. Deliveries now range from two weeks upward, some makers being fully a month behind in their shipments. With the increased activity, price conditions have strengthened and makers are less inclined to make concessions for desirable specifications for quick shipment. We quote the market as follows:

Hoops in carload lots, 1.50c; in less than carload lots, 1.60c; bands, 1.35c, base half extras as per standard steel.

Merchant Bars.—While there is a stronger disposition among makers to quote more nearly uniform prices on steel bars with 1.35c Pittsburg as the minimum, some manufacturers are holding higher and are asking

1.40c and even 1.45c. On last quarter business, the 1.40c price appears quite firmly established. Makers continue to receive very heavy specificatons and gradually to fall behind in their deliveries. Consumers are taking bars very freely and middlemen have not be n able to accumulate much stock. With the higher scrap prices, bar iron is stronger in all markets and the 1.50c level which has been quoted by some makers for sometime is now the minimum in Pittsburg territory. Some producers are asking advances. Buying is active in small lots. Shafting is moving well and is reasonably firm. We quote the present market as follows:

Common iron bars, 1.50c to 1.55c, Pittsburg; Bessemer and open-hearth steel bars, 1.35c to 1.40c; plow and cultivator, 1.35c to 1.40c; channels, angles, zees, tees, under 3-inch, 1.45c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size, 0.30c advance. Cold rolled and ground shafting, 60 per cent in carloads and 55 per cent in less than carloads, delivered in base territory. Planished and machine straightened tire is 1.55c base; iron finished tire under 1½ by 1½ inches, 1.50c, both plus ½ extra on tire card; iron finished tire, 1½ x ½ and over, 1.35c, plus ½ extra on the steel bar card.

On cold rolled strip steel, width 1½ inches and wider, and 0.100 inch and thicker, we quote base prices for 100 pounds, $3.05 on hard, and $3.30 on soft.

Structural Material.—The general level of prices on fabricated steel is higher, but there are still instances of low figures being made under conditions of close competition. Some shops apparently have come close to, if not passed, the extreme of overselling and may have trouble in making deliveries within specified time. Deliveries of plain material from the mills are also getting far behind and are having a strong bearing on the fabricated situation. The present inquiry is fair and there are numerous small jobs in sight, many industrial plants preparing for extensions. Shape prices continue at the minimum of 1.40c Pittsburg, but reports are current that an advance soon is not unlikely. The American Bridge Co. will fabricate 1,500 tons for the new coal dock of the Philadelphia & Reading Coal Co. at Superior, Wis., for which Heyl & Patterson, Pittsburg, have the general contract. The Fort Pitt Bridge Works has taken 600 tons for the Spring Common viaduct at Youngstown. The Empire Construction Co., Chicago, is the low bidder and has been given the contract for the construction of the chain of rocks settling basin of the city of St. Louis for which 1,200 tons of sheet steel piling will be required. The award of the piling has not been definitely made. We quote the market on structural shapes as follows:

Beams and channels, 15-inch and under, 1.40c to 1.45c; over 15 inches, 1.50c to 1.55c; zees, 1.40c to 1.45c; tees, 1.40c to 1.45c; angles, from 3 to 6 inches, 1.40c to 1.45c; over 6 inches, 1.50c to 1.55c; universal and sheared plates, 6¼ inches wide and wider, 1.40c to 1.45c.

Merchant Pipe.—Orders for merchant pipe from the jobbing trade are very heavy in preparing for the fall demand of consumers which usually comes in September and October. August is normally an active month in this respect and the present period is comparing very favorably with other full years. There have been no changes in merchant pipe prices. The call for oil and gas field goods is strong, but there are no new large pipe line projects before the market. The different works of the National Tube Co. are now running practically full. We quote the following official discounts on merchant pipe subject to an additional one point and five off to jobbers:

	—Steel—		—Iron—	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch.....	72	56	67	..
⅜ inch	73	59	68	54
½ inch	76	64	71	59
¾ to 6 inch	80	70	75	65
7 to 12 inch	75	60	70	53
PLUGGED AND REAMED.				
1 to 4 inch	78	68	73	63
EXTRA STRONG PLAIN ENDS.				
⅛ to ¾ inch.....	65	53	60	48
½ to 4 inch.....	72	60	57	55
4½ to 8 inch.....	68	56	63	51
DOUBLE EXTRA STRONG PLAIN ENDS.				
½ to 8 inch.....	61	50	56	45

Boiler Tubes.—A better buying of locomotive tubes is current, but the demand is still much below normal. The merchant trade is better, but conditions can scarcely be considered as active. Tube prices are somewhat unstable. We quote the following official discounts on lap-welded steel boiler tubes to jobbers in carloads:

1 to 1½ inch	50
1¾ to 2¼ inch	62
2½ inch	64
2¾ to 5 inch	70
6 to 13 inch	62

2½ inch and smaller, over 18 feet, 10 per cent net extra.

2¾ inch and larger, over 22 feet, 10 per cent net extra.

To destinations east of the Mississippi river will be sold at delivered discount for carloads lowered by two points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburg.

We quote the following official discounts on charcoal iron tubes to jobbers:

1 to 1½ inch	45
1¾ to 2¼ inch	45
2½ inch	50
2¾ to 5 inch	57
6 to 13 inch	45

Wire Products.—A heavy fall movement in wire products to consumers is anticipated, but as yet no consistent ordering activity in preparation for this demand has been started. Some jobbers are, however, beginning to order a little more freely, although many of them have stocks of nails and wire on hand taken at the previous low prices. The manufacturing trade is specifying more heavily, comparatively speaking, than the jobbers. Prices are firm and we quote as follows:

Wire nails, jobbers' carload lots, $1.80; retailers' carload lots, $1.85; painted barb wire, jobbers' carload lots, $1.80; retailers' carload lots, $1.85, with 30c for galvanizing; plain wire to jobbers in carloads, $1.60, and to retailers in carloads, $1.65; polished staples, $1.80; galvanized staples, $2.10.

Wire Rods.—Consumers of rods in this territory are all covered and there is little business to test the market which we quote nominally $31, Pittsburg, on Bessemer and $32, Pittsburg, on open-hearth rods.

Coke.—The action of the United States Steel Corporation in purchasing a considerable block of coke for shipment the remainder of the year and the continued labor shortage in the Connellsville region, which is curtailing operations, have been factors in contributing to a further advance in coke prices. Both spot and contract material are higher. The purchase of the Corporation is the first in the open market it has negotiated in several years. A number of furnaces have entered the market for their first half requirements aggregating about 50,000 tons a month, but sellers are showing a reluctance to name quotations at this time. Little business has been closed for next year, which would indicate the market level for that delivery. There is also some inquiry by furnaces for shipment the remainder of this year. Foundry coke consumers are specifying freely and some large operators are getting behind in their shipments. We quote spot furnace coke at from $1.80 to $1.85, ovens, and on contract to the end of the year at $2, ovens. On first class foundry coke, the range is from $2 to $2.10 on prompt and from $2.10 to $2.35, ovens, on contract. The *Courier's* figures for the week ending Aug. 14 show 30,829 ovens active with an output of 395,188 tons,

compared with 30,542 active ovens and a production of 395,664 tons the previous week.

Old Material—Higher prices are ruling throughout the old material market with a strong advancing tendency in evidence. The dealers are firmer than ever in their faith in continued upward movement and are declining to make offerings of material except where forced to ship, although the mills are more disposed to treat for tonnage and are willing to close for $17, steel. The closely-held condition of scrap is causing consumers to keep in touch with the pig iron market and to regulate their furnace mixtures accordingly, using more basic pig than in customary practice by reason of the comparative higher price of old material. Difficulty is encountered in obtaining low phosphorus scrap which the mills are holding tightly and some buyers are offering $21 for this grade. Sales in the general market are not heavy owing to prevailing conditions. We quote gross tons delivered in the Pittsburg district, as follows:

Heavy melting scrap, $16.50 to $17; re-rolling rails, $17 to $17.50; bundled sheet scrap, $14.75 to $15.25; iron axles, $25 to $26; old iron rails, $18.50 to $19; No. 1 wrought scrap, $17 to $17.50; old car wheels, $16.25 to $16.75; low phosphorus, $20 to $21; machine shop turnings, $11.50 to $12; cast borings, $9 to $10; No. 1 cast scrap, $15 to $16; malleable, $15.25 to $15.75; stove plate, $12 to $12.50.

CLEVELAND.

Heavy Demand for Ore—Extensive Inquiry for Foundry Pig Iron.

Office of THE IRON TRADE REVIEW, Browning Building, Aug. 24.

Iron Ore.—Buying of iron ore has continued at such a lively rate that some important ore interests have sold nearly all their choice ores and are wondering how they will meet the demand of customers who have not yet covered for their full requirements. It is estimated that the ore movement for the present month will amount to 7,250,000 tons.

On base ores, with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $4.50; Mesabi Bessemer, $4.25; old range non-Bessemer, $3.70; Mesabi non-Bessemer, $3.50.

Pig Iron.—Heavy inquiry for foundry grades represents a large number of melters, the most important inquiry being for 9,000 tons from the Detroit Stove Works for delivery next year. This inquiry is for analysis iron, of which 3,500 tons is practically No. 2, and 3,500 No. 3 foundry, and 2,000 tons is silvery, running from four to five per cent silicon. One sale of a small tonnage of No. 2 foundry for immediate delivery was made at $16.50 delivered in Cleveland. The usual quotation for first quarter for No. 2 is $16.75 delivered in Cleveland, and $16.50, Cleveland furnace, for outside delivery. The sale of 15,000 tons of standard Bessemer to the Youngstown Sheet & Tube Co. for delivery during the remainder of this year at $16.50, valley furnace, indicates an advance of 50 cents per ton on that grade. For first quarter of 1910, the quotation on 8 per cent silicon iron is $19.00, an advance of 50 cents on spot iron. We quote, delivered in Cleveland, as follows:

No. 1 foundry	$17.00 to 17.25
No. 2 foundry	16.50 to 16.75
No. 3 foundry	16.25 to 16.50
No. 2 southern	17.35
Gray forge	15.00 to 15.50
Bessemer	16.25 to 16.50
Lake Superior charcoal	19.50 to 20.00
Jackson Co. 8 per cent silvery	20.05

Coke.—There is very little activity in foundry coke, but several furnaces are inquiring for their requirements for the first half of the year and report that they have received quotations ranging from $2 to $2.50. We quote spot furnace coke at from $1.70 to $1.75 ovens, and on contract for the remainder of the year, $1.75 to $1.85. We quote hgh grade Connellsville foundry coke at $2 to $2 25 for immediate shipment, and $2.25 to $2.50 on contract for the first half of next year.

Finished Materials.—Both mills and jobbers are doing a very large volume of business and mills are having a great deal of trouble in meeting the demands of their customers on deliveries. The steel bar situation is extremely strong, and in some cases, contracts running up to Jan. 1 have already been fully specified, and consumers are in the market for tonnages to meet their requirements for the remainder of the year. Bar iron is somewhat firmer, and local mills have been able to get enough orders to continue in operation. Premiums of from $1 to $3 per ton are being paid for prompt delivery of plates and shapes by eastern Pennsylvania steel companies.

Old Material.—Although prices remain about the same as quoted last week, the market holds firm and there is no apprehension on the part of either brokers or dealers that there will be any break whatever. The feeling is strong, however, that the next few weeks will see a marked demand, bringing with it a general increase. We continue to quote f. o. b. Cleveland as follows:

Old iron rails	$18.00 to 18.50
Old steel rails (re-rolling)	16.00 to 16.50
Old steel rails (under 6 feet)	15 50 to 16.00
Old car wheels	15.50 to 16.00
Old steel boiler plate	13.50 to 14.00
Malleable iron (railroad)	19.00 to 19.50
Steel axles	16.00 to 16.50
Malleable iron (agricultural)	14.00 to 14.50
Heavy steel	15.25 to 15.75
Country mixed steel	14.00 to 14.50
Low phosphorus	17.50 to 18.00

We quote, net tons, as follows:

No. 1 R. R. wrought	$14.50 to 15.00
No. 1 busheling	13.00 to 13.50
No. 1 machine cast	13.00 to 13.50
Iron axles	19.50 to 20.50
Axle turnings	11.00 to 11.50
Machine shop turnings	9.50 to 10.00
Grate bars	12.00 to 12.50
Pipes and flues	12.00 to 12.50
Tank iron	11.50 to 12.00
Hoop and band iron	9.50 to 10.00
Sheet iron	8.00 to 8.50
Wrought drilling	9.50 to 10.00
Stove plate	11.50 to 12.00
Cast borings	7.50 to 8.00

CINCINNATI.

Southern Interests Open Books for First Quarter—Northern Prices Firmer.

Office of THE IRON TRADE REVIEW, First National Bank Bldg., Aug. 24.

Pig Iron.—As predicted last week there is shown an inclination on the part of at least two southern furnaces to make a price for next year; and those heard are $13.75, and $14, Birmingham, for No. 2 foundry. While a compratively small tonnage has been booked at these figures for the first quarter, and no effort is making or has been made to book business at either level, it is felt that the latter price will prevail. It is believed that all $13 iron has been absorbed, and $13.50 today represents about the bottom on southern No. 2 at furnace for any delivery this year. Northern irons have again stiffened, and while there seems to be still a little spot shipment metal at $15, the price for any delivery beyond September is $15.50, Ironton. This price rules also for the first quarter, with some furnaces asking $15.75 to $16 for that delivery. At present quoted prices the northern irons would seem to have the best of it into central and near-by consuming territory. For instance, with a rate of $4.10 from Birmingham, $13.50 iron would figure $17.60, delivered, against $16.70 for northern No. 2, a difference of 90 cents in favor of the northern product.

There are some very good inquiries received from stovemakers in Michigan and Ohio territory; and some malleable also is wanted. A Michigan stove manufacturer asks for prices on 7,000 tons of analysis foundry iron running 1.75 and over and 2.25 and over in silicon, and 0.80 to 1.25 in phosphor-

us, figured as practically 2 and 3 foundry, and 2,000 tons of silvery, running from 4 to 5 per cent for the first half. An Ohio stovemaker wants prices on some foundry iron for the first quarter or half. Ohio silveries are quotable still on the basis of $18.50 for 8 per cent, and a premium of 50 cents is asked for deliveries for first quarter. Malleable is growing in favor; the price at present about on a parity with foundry No. 2.

There seems to be a wider range in forge irons than any other at this time—the asking price ranging from $11.50, Birmingham, to $12.50 over the remainder of the year. One large local agency turned down a fair sized tonnage at $11.50. Ferro-manganese is becoming active, sales in the past few days advancing from $40.50 to $42 minimum and establishing a range of $42 to $45 according to delivery conditions. A northern Ohio concern wants 1,500 tons of malleable for the first quarter. Scattering sales are noted of from a couple of car loads to 300 and 400 tons in all the large agencies, and mostly of foundry iron.

A Michigan manufacturer of radiators is said to have bought of a local furnace interest the greater part of his requirements, aggregating 7,000 to 8,000 tons.

An engine manufacturer in central Ohio territory bought 1,000 to 1,500 tons of northern iron. For September shipment and remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from the Hanging Rock district, we quote as follows:

Southern foundry No. 1 .....$	17.25
Southern foundry No. 2	16.75
Southern foundry No. 3	16.25
Southern foundry No. 4	15.75
Southern No. 1 soft	17.25
Southern No. 2 soft	16.75
Southern gray forge	15.00 to 15.50
Northern No. 1 foundry.....	16.70 to 17.20
Northern No. 2 foundry	16.20 to 16.70
Northern No. 3 foundry	15.70 to 16.20
Wise county furnace coke.....$	1.70 to 1.85
Standard Connellsville foundry coke	2.00 to 2.35
No. 1 machinery, net tons.....	14.00 to 14.50
Cast borings, net tons.....	7.00 to 7.50
Jackson county 6 per cent silicon	18.70
Jackson county 8 per cent silicon	19.70
Jackson county 10 per cent silicon	20.70

Finished Material.—Little change is to be noted in price and delivery conditions on finished material in this market. Steel bars are still firm at 1.35c Pittsburg, and 1.40c is asked on less than carload lots. The same is true of structural material; the price of 1.40c, Pittsburg, is firm for more than carload lots with a price of 1.45c on less. Conservative opinion gives November as the earliest at which mills will begin to figure on next year's deliveries. Iron bars are gaining in sales interest, and the price is about 1.45c local mill. Specifications on all finished material are strong and the mills are as a rule inclined to extend still further time of deliveries.

Coke.—There is some inquiry this week from northern Ohio furnace interests for prices on first half delivery covering their requirements for that period. This tonnage will foot up something like 30,000 to 35,000 tons per month. There is little or no change in existing quotations, but the tone is strengthening because of scarcity of labor in oven regions, and the more conservative interests do not believe it policy to take on a lot of business until the outlook is more promising. Consumers are taking coke on contract in gradually increasing quantities, particularly the foundry interests. There is practically no inquiry for the remainder of the year and coke producers have not as yet opened their books for next year. The following table shows range of prices in leading coke-producing fields:

	Per Ton.
Southern foundry No. 4	15.75
Wise county foundry coke.....	2.00 to 2.25
Pocahontas furnace coke	1.75 to 1.85
Pocahontas foundry coke.....	1.90 to 2.25
Standard Connellsville furnace coke.	1.75 to 2.00
Standard Connellsville foundry coke	2.00 to 2.25

Old Material.—Taken as a whole, the list of scrap shows the mid-summer dullness, but some fairly good sales of old car wheel into Chicago territory, as well as several thousand tons of No. 1 wrought scrap at about $17 gross are noted.

St. Louis territory has also been a good buyer, and one dealer reports a sale of 5,000 tons of relayers via that city for delivery into Texas territory. Dealers here anticipate a good opening for September and as a rule are well prepared with complete stocks in all items; quotations to the trade being about as follows f. o. b. Cincinnati:

Old No. 1 R. R. wrought net tons .....$	14.50 to 15.00
No. 1 machinery, net tons.....	13.50 to 14.00
Old iron rails, gross tons.....	15.00 to 16.00
Old steel rails (re-rolling) gross tons	14.00 to 14.50
Old short lengths, gross tons....	13.50 to 14.00
Old iron axles, net tons.....	17.00 to 17.50
Heavy melting scrap, gross tons.	14.00 to 14.50
Stove plate, net tons	10.50 to 11.00
Heavy turnings, net.....	9.50 to 10.00
Cast borings, net tons.....	7.50 to 8.00
Car wheels	14.50 to 15.50

PHILADELPHIA.

Heavy Transactions in Basic—Mills Are Extremely Busy.

Aug. 24.

Pig Iron.—Basic again claims the bulk of attention in this district, principally for 1910 delivery, though several small lots of prompt Virginia iron sold during the week at $17.50, delivered. For next year's iron the minimum with all producers is $18, delivered, and on this basis several lots aggregating over 20,000 tons have been placed, chiefly for shipment over the entire first half. These sales, coupled with one of about 24,000 tons, closed about 10 days ago, but not previously noted in this column, make total transactions in basic of well over 50,000 tons, of which only a small part was Virginia product. Furnaces in this district are by no means anxious to sell and are merely accepting what business is offered. In foundry grades we note brisk selling in lots up to 1,000 tons, the price range for shipment over the balance of the year being $17.35 to $18, delivered, for No. 2X, while Virginia irons are establishing themselves on a $15 basis. There is still a brisk call for pipe-making irons, but no important sales can be discovered. Low phosphorus is stronger by virtue of recent sales totaling a good tonnage. A report of the Eastern Pig Iron Association, prepared in connection with the meeting last week, showed a further heavy increase in orders on books and a substantial decrease in stocks on furnace yards, despite the increased capacity in operation. The report showed 27 stacks producing, with six additional stacks which will become operative some time before Jan. 1. Berkshire furnace is to go in at once, but considerable capacity now active will shortly be forced out for relining. Deliveries are improving, but on basic iron continue poor. We quote, delivery over the balance of the year at eastern Pennsylvania points, as follows:

No. 1X foundry .....$	17.75 to 18.25
No. 2X foundry	17.25 to 17.75
No. 2 plain	16.75 to 17.25
Standard gray forge	16.25 to 16.75
Basic	17.50 to 18.00
Low phosphorus	20.50 to 21.00
No. 2 Birmingham.....	16.50 to 17.00
No. 2X Virginia	17.50 to 18.00
No. 2 plain Virginia.....	17.00 to 17.50

Finished Materials.—With one or two exceptions, mills in this district are running absolutely at maximum capacity, and the situation as regards both prices and deliveries is steadily gaining strength. Local plate mills are shipping as far west as Ohio, showing the willingness to pay substantial premiums for prompt material. Except in the case of rails, in which independent interests generally followed the Corporation's lead, no 1910 orders are being considered, though there is considerable pressure to force certain interests to open their books on bars. Billets are growing scarcer and command better premiums. The railroads are buying good lots of plates and shapes for car repair work, and the miscellaneous requirements of ship yards are increasing. Shapes and plates are now firm at 1.60c, in sizable lots, equivalent to 1.45c, Pittsburg, and bars at 1.50c. Iron bars are quoted at 1.45c to 1.50c, delivered.

Old Materials.—The placing of an embargo on scrap at the Bethlehem works on Monday, and the request for a suspension of shipments to Steelton, indicate that the joint buying arrangement is keeping its plants well supplied, although the real test of its ability in this direction will come within the next two or three weeks, following the completion of deliveries on a good many contracts held by the mills at the time the plan became operative. The combined requirements of the interested mills is estimated at about 2,000 tons per day, but so far this has been largely supplied by old contract. The Sparrow's Point plant, which is not yet in shape to operate its open-hearth department, is shipping car loads of rails to the joint buyer, and the tonnage involved in this movement may reach 25,000. No important importations are reported, though small lots are coming from the south. The Isthmian canal commission will open bids Sept. 7 for its accumulations of scrap, with the amount stated as 40,000 to 120,000 tons. One or two cargoes of San Francisco material are enroute to the east, but inability to secure American boats prevents a more rapid movement. We quote, gross tons, eastern Pennsylvania delivery, as follows:

Old steel rails (rerolling)	$18.25 to 18.75
No. 1 steel scrap	17.25 to 17.75
Old steel axles	22.50 to 23.00
Old iron axles	24.50 to 25.00
Old iron rails	20.00 to 21.00
Old car wheels	16.00 to 16.50
Choice scrap R. R. No. 1. wrought.	19.50 to 20.00
No. 1 yard scrap	18.00 to 18.50
Machinery scrap	15.75 to 16.25
Low phosphorus scrap	20.50 to 21.00
Wrought iron pipe	16.50 to 17.00
No. 1 forge fire scrap	15.00 to 15.50
No. 2 forge fire scrap, ordinary	9.50 to 10.00
Wrought turnings	14.00 to 14.50
Axle turnings, heavy	14.00 to 15.00
Cast borings	12.00 to 12.50
Stove plate	14.00 to 14.50

CHICAGO.

Buyers More Active—Rail Orders Placed by Western Roads.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, Aug. 24.

The wave of prosperity certainly is gaining headway with every week. The week which has just gone into history has seen an increase in the force and volume of the onward movement fully as great as that which has marked the passing of any preceding seven days. Buyers are beginning to realize, although not fully, as yet, what the real significance of the situation is, and their inquiries and offers are more numerous and more like actual business. Some well-posted authorities, whose opinion carries much weight in the world of steel, are expecting the volume of business done by the Steel Corporation in the year 1910, either calendar or fiscal, to exceed by a very heavy margin, the largest business ever done by that company in any year. This will mean, if the prophecy comes true, that this leading interest will transact a business to exceed $765,000,000, which was the record for the high year of 1907. The situation in the pig iron market is distinctly stronger, and former maximum prices have become minimum prices, and they, in turn, are expected to make way for the present maximum figures, which are destined, according to safe forecasters of the market, to mark the top of the market for only a short time. Jackson county silveries have been advanced a half-dollar a ton, for delivery during first quarter of next year, and advances have been made in southern and northern irons, to an even greater degree. All lines of finished and semi-finished material continue to be rushed, and advances are seen in nearly everything. The works furnishing fabricated material are falling further and further behind their orders. Much interest is centered in the steel rail division of the steel industry, since the Corporation opened its books, last week, for 1910 business. This has given fresh impetus to the market, and has been followed by the placing of large orders for track supplies, and the inquiry for a great deal more. The Chicago & Northwestern railway bought 60,000 tons of Bessemer and open-hearth rails, from the Illinois Steel Co., the proportion of each to be optional with the buyer. The Santa Fe system bought 145,000 tons of open-hearth rails, a portion of which will be used in an extension which the road is building from Coleman, Tex., on one of the system's branch lines, to connect with the main line at a point at or near Texico, Tex., on the state line between the latter state and New Mexico, a distance of practically 300 miles. Of the 145,000 tons of rails purchased, 28,000 tons were from the Colorado Fuel & Iron Co., and the balance from the Illinois Steel Co. Following the purchase of the rails, the Santa Fe purchased, or practically has closed for over 35,000 tons of track supplies, including rail-joints, tie-plates and bolts. One feature of the market, which has been commented upon in these reports, as a menace to the smooth-running of the prosperity movement which might be encountered before the winter came, already has begun to be felt, both in the north and in the south. This is the dreaded car shortage. No little complaint has been made in the past week, by shippers, who have been unable to secure a satisfactory supply of cars for their business.

Pig Iron.—The pig iron market has made a still further advance this week, both in strength and price. More and more interest is being taken by buyers in deliveries for the first quarter of 1910, and yet it is said that there are some who still have not awakened to a full realization of the significance of the upward movement which has been on for some weeks, and will continue for a considerable time to come. This latter seems to be as much of a moral certainty as the succession of one season after another. The week has seen a heavy inquiry for iron, especially for the foundry and malleable grades, and the tonnage represented by sales has exceeded expectation. While it is well nigh impossible to arrive at an absolutely reliable estimate of the amount of pig iron which has been sold in this market in any one week, it is quite probable that the total for the past week, since our last report has been as much as 25,000 tons, a goodly portion of which has been malleable. Crane Co. is credited with buying a good sized lot of the latter. A sale of 1,000 tons southern No. 2, at $14.00, Birmingham, is among the week's transactions, of which, 600 tons was for last quarter's delivery, and 400 tons for the first quarter of next year. A flat offer also was received of $14, Birmingham, on 400 tons No. 2, for December, January and February delivery. The leading local interest sold 10,000 tons No. 2 for Bay View furnace, at $18.50, Milwaukee, for first quarter's delivery. This sale sets the high water mark of the present advance. The iron goes to Milwaukee interests. The leading Jackson county, O., interest has advanced the price of silvery iron to a basis of $19.00, furnace, for 8 per cent silicon, for first quarter of 1910, and it is understood that the other furnaces are following suit. Although our minimum quotation this week, on Northern No. 2, is $18.00, it is not unlikely that that price would be shaded on a firm offer, for this year's delivery. We quote:

Lake Superior charcoal	$19.50 to 20.00
Northern foundry No. 1	18.50 to 19.00
Northern foundry No. 2	18.00 to 18.50
Northern foundry No. 3	17.50 to 18.00
Southern foundry No. 1	18.35 to 18.85
Southern foundry No. 2	17.85 to 18.35
Southern foundry No. 3	17.10 to 17.60
Southern foundry No. 4	16.60 to 17.10
Southern No. 1 soft	18.35 to 18.85
Southern No. 2 soft	17.85 to 18.35
Southern silveries, 4 per cent silicon	18.35 to 18.85
Southern silveries, 5 per cent silicon	18.85 to 19.35
Southern silveries, 6 per cent silicon	19.85 to 20.85
Jackson Co. silveries, 6 per cent.	20.40
Jackson Co. silveries, 8 per cent.	21.40
Jackson Co. silveries, 10 per cent	22.40
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	18.65 to 18.90
Alabama basic	17.85 to 18.35

Billets.—So far as Chicago is concerned, there practically is no billet market. For the present, the Chicago

price is arrived at by adding the freight to the Pittsburg quotations. There is a scarcity of open-hearth steel, which amounts to a shortage, temporarily at least.

Merchant Bars.—Specifications are coming in at a very heavy rate, principa ly from railroads, car shops and bridge builders, but all lines are contributing their share. Car orders continue to be placed in large numbers. Prices for bars, both iron and steel, are firmer this week. We quote for Chicago delivery, as follows:

Bar iron, 1.45c to 1.50c; hard steel 1.45c to 1.50c; soft steel bars and bands, 1.53c to 1.58c, half extras, soft steel angles, less than 3 x 3, 1.63c to 1.68c, half extras; hoops, 1.63c to 1.68c base, full extras; p'anished or smooth finished tire steel, 1.63c to 1.68c; iron finish, up to 1½ x ½ inch, 1.63c, base, tire card; iron finish, 1½ x ¼-inch and larger, 1.43c to 1.48c base, steel card; channel for solid rubber tires, ¾ to 1 inch, 1.93c to 1.98c; and 1⅛ inch and larger, 1.83c to 1.88c; smooth finished machinery steel, 1.73c; flat sleigh shoe, 1.53c; toe calk steel, 2.03c; spring steel, 2.08c; crucible spring steel, 2.58c; tool steel, 7c to 9c, with higher prices for special grades. Quotations on shafting are 60 per cent off the list for carload lots, and 55 per cent off for less than carload lots, carload freight allowed to points in base territory. On iron and steel bars from local stocks, we quote as follows: Bar iron, 1.70c to 1.80c, base, full extras; soft steel bars, 1.70c to 1.80c per 100 pounds base, plus half extras; soft steel hoops, 2.20c, full extras.

Structural Material. — The market continues to hold the center of the stage, as it has for some weeks. Mills find their difficulties increasing, rather than lessening, and the situation takes on a more serious aspect every week. Prices are higher for material from mill. Orders for the past week, approximated 11,000 tons. The American Bridge Co. reports increases of about 5,000 tons to orders from railroads, already on its books; also, an office building at Texas City, Tex., 162 tons, and Station No. 223, for the Interstate Transfer Co., Minneapolis, Minn., 200 tons. The South Halsted Iron Works, Chicago, secured the contract for the Fidelity Trust Co. building, 390 tons, at Tacoma, Wash. The Isham estate bui ding, on State street, Chicago, 1,144 tons, went to the Morava Construction Co. A lot of signal bridges for the Chicago & Northwestern, at Chicago, 210 tons, went to the Modern Structural Steel Co., Waukesha, Wis. The contract for the shaft house at the Cleveland-Cliffs Iron Co.'s Princeton mine, near Marquette, was secured by the Worden-Allen Co., Milwaukee. The contract amounted to 310 tons. The Alworth building, at Duluth, 990 tons, went to the McClintick-Marshall Construction Co. A coal-handling plant for the Phi.adelphia & Reading R. R., at Superior, Wis., 1,860 tons, went to Heyl & Patterson, Pittsburg. The San Quentin (Cal.) prison, 164 tons, was secured by the Western Iron Works, San Francisco. The Gene Parker school, San Francisco, 360 tons, went to the Ralston Iron Works, of that city. The general contract for the Municipal Courts building, St. Louis, was let to the Gray Construction Co., of that city. The 1,000 tons of steel required has not yet been placed. We quote mill prices for structural shapes, Chicago delivery, as follows:

Beams and channels, 15-inch and under, 1.63c to 1.68c. For extras see Pittsburg report.

Local store prices are as follows:

All angles, 3 inches and larger, including 6 inches, $1.80 per 100 pounds; angles over 6 inches, $1.90 per 100 pounds base; 3 to 15 inches, inclusive, $1.80 per 100 pounds base; channels 3 inches and larger, $1.80 per 100 pounds base.

Rails and Track Supplies.—The Santa Fe has bought over 14,500 tons of open-hearth rails at $30 per ton, and is about to close for 22,000 tons of tie plates and 12,000 tons of rail joints and 700 tons of bolts. The Chicago & Northwestern has bought 60,000 tons of Bessemer and open-hearth rails for next year's delivery. A very fair tonnage of rails was sold by the independent interests in small lots during the week.

See Pittsburg report for prices on standard sections. On light rails, Chicago delivery, we quote as follows:

Light rails, 40 and 45-pound, $26; 30 and 35-pound, $26.75; 16, 20 and 25-pound, $27; 12-pound, $28. In lots of 250 to 500 tons a reduction of 60 cents a ton from these prices is made; lots of 500 tons and up carry a reduction of $1 a ton. Track supplies, f. o. b. Joliet, angle bars, 1.50c to 1.60c; railroad spikes, 1.75c to 1.85c; smaller size spikes, 1.85c to 1.95c base; track bo'ts, with square nuts, 2.15c to 2.20c; with hexagon nuts, 2.30c to 2.40c.

Plates.—A very satisfactory tonnage continues to be booked by the local interests, and prices show no signs of any backward movement; on the contrary, there is some hardening in this, as well as other lines. We quote, for Chicago delivery, as follows:

Tank plates, ¼-inch thick, 6¼ to 100 inches, 1.58c to 1.63c. For extras see Pittsburg report. Store quotations are without change, as follows:,

Tank steel, ¼-inch and heavier up to 72 inches wide, 1.80c to 1.90c; from 72 inches wide to 96 inches wide, 1.90c to 2c; 3/16-inch up to and including 60 inches wide, 1.90c to 2c; 72 inches, 2.15c to 2.25c; No. 8 up to 60 inches wide, 1.95c to 2.05c. Flange and head quality, 25c extra.

Sheets.—A heavy demand is reported in this line, especial y in roofing sheets, as is usual at this time of the year.

For mill prices, see Pittsburg report. Freight to Chicago, 18 cents. We quote store prices at Chicago as follows:

No. 10, 2.10c to 2.20c; No. 12, 2.15c to 2.25c; No. 14, 2.20c to 2.30c; No. 16, 2.30c to 2.40c; Nos. 18-20, 2.50c to 2.55c; Nos. 22-24, 2.55c to 2.60c; No. 26, 2.60c to 2.65c; No. 27, 2.65c to 2.70c; No. 28, 2.75c to 2.80c; No. 30, 3.05c; galvanized sheets, Nos. 10 to 16, 3c to 3.10c; Nos. 18 and 20, 3.05c to 3.15c; Nos. 22 to 24, 3.20c to 3.25c; No. 26, 3.40c to 3.45c; No. 27, 3.60c to 3.65c; No. 28, 3.80c to 3.90c; No. 30, 4.20c to 4.50c.

Wire Products.—Rivet, bolt and screw manufacturers are very busy and buying liberally. Jobbers' and retailers' stocks are light, in some lines. Trade in the south was a little tardy in starting, but is now fairly under way. We quote, Chicago delivery, as fol'ows:

Wire nails, jobbers' car lots, $1.98; retailers' carload lots, $2.03; retailers, less than carload lots, $2.13; painted barb wire, jobbers' carload lots, $1.98; retailers, carload lots, $2.03, with 30c for galvanizing; plain wire to jobbers, carload lots, $1.78; staples, $1.98.

Merchant Pipe.—There is only the usual fairly good trade for this season reported, with prices remaining unchanged. We quote, for lap-welded tubes, out of store, 65 off, and for charcoal, 50 off. For mill discounts, see Pittsburg report.

Cast Iron Pipe.—Routine business in small orders of 100 to 300 tons, characterized this market the past week. Prices are unchanged, as follows: Four-inch water pipe, $27.50; 6 to 14 inches, $26.50; larger sizes, $25.50; gas pipe, $1 a ton higher.

Old Material.—This market does not show the same activity that it did for a few weeks, but it seems to have come to a period of quiet, following the litt'e flurry. Prices, in the main, show a slight concession. We quote:

Old car wheels	16.25 to 16.50
Old iron rails	18.75 to 19.00
Rerolling rails (4 ft. and over)	16.50 to 16.75
Old steel rails (2 ft. and under)	16.25 to 16.50
Light section relayers, 45 lbs. and under subject to inspection	21.00 to 23.00

Relaying rails, subject to inspection	22.50 to 23.50
Frogs, switches and guards	15.00 to 15.50
Heavy melting steel	15.00 to 15.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$15.00 to 15.25
No. 2 R. R. wrought	14.00 to 14.25
Arch bars and transoms	17.25 to 17.50
Knucklers, couplers and springs	14.25 to 14.50
Shafting	16.50 to 17.00
Iron car axles	20.00 to 20.25
Steel car axles	19.00 to 19.25
Locomotive tires	15.50 to 15.75
Dealers' forge	12.50 to 12.75
Pipes and flues	11.00 to 11.25
No. 1 cast, 150 lbs. and less	14.25 to 14.50
No. 1 busheling	12.00 to 12.50
No. 2 busheling	9.00 to 9.25
No. 1 boiler cut	10.75 to 11.25
Boiler punchings	13.75 to 14.00
Cast and mixed borings	6.50 to 6.75
Machine shop turnings	8.75 to 9.00
Railroad malleable	14.25 to 14.75
Agricultural malleable	11.50 to 12.00
Stove plate and light-cast scrap	12.00 to 12.25
Angle bars, splices, etc. (iron)	16.50 to 17.00

BUFFALO.

Pig Iron Quiet, but the Tone of the Market is Strong.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, Aug. 24.

Pig Iron.—A very quiet condition of business is the principal feature of the pig market this week. Selling is light, but the output of the furnaces is being moved rapidly. A price of $15.75, Buffalo, continues as the minimum quotation on No. 2 foundry iron, with a maximum on general business 50 cents in advance of this price. Certain interests, however, are holding at a slightly higher price and taking care of current business at an advanced price. The general tone of the market is strong in spite of the fact that several leading foundry interests are still running below normal. Inquiry at this time is fair and some large inquiries for 1910 deliveries are received occasionally, and there is now some selling for delivery during the first quarter. Sales for advanced deliveries are, however, by no means numerous, but they carry a price averaging 75 cents advance of the prices quoted for prompt delivery. It is said that there is some uncertainty on the part of several large consumers in regard to covering their needs for 1910. We quote f. o. b. Buffalo for prompt delivery as follows:

No. 1X foundry	$16.25 to 16.75
No. 2X foundry	15.75 to 16.25
No. 2 plain	15.25 to 15.75
No. 3X foundry	15.00 to 15.25
Malleable Bessemer	15.50 to 16.00
Gray forge	15.00 to 15.25
Charcoal	19.50 to 20.50

Finished Products. — The general tone of the finished material market is very satisfactory and indications are good for a continuance of the demand for structural and bar material. All the mill interests seem to be oversold about two months and in some instances nearly three months. Prices are strong with an advancing tendency. The Steel Corporation is quoting 1.35c f. o. b. Pittsburg, minimum, on desirable steel bar business, deliveries to Nov. 1, and on structural shapes and plates, 1.40c. The independent interests are reluctant to quote on bars for early deliveries. On structural shapes and plates, 1.45c, and a price of 1.35c on bars, f. o. b. Pittsburg, is asked. Structural lettings have not been numerous. The general contract for erecting the Beyer's building, Buffalo, went to the Buffalo Structural Steel Co. The Lackawanna Steel Co. will furnish the structural steel, 400 tons. Considerable business is in prospect, including a new postoffice building at Saratoga Springs, N. Y., at cost of $90,000, to be built of brick, stone and structural steel. I. J. Lands will build a factory at Buffalo, costing $30,000. The general contract has been awarded to the Obenback Construction Co., Niagara Falls, N. Y. The building will be of stone and steel. About 400 tons of structural will be required in the building for the Phoenix brewery. The Buffalo & Southern electric railway is expected to be in the market for standard steel rails at an early date. The road will be extended 8 miles. The Schenectady Railway Co. is replacing a large number of wooden poles with tubular steel material. The company intends to make these poles general throughout its lines. The Rochester, Syracuse & Eastern railroad will increase the capacity of its power house at Lyons, N. Y., with new boilers and transformer equipment. In Syracuse an apartment building will be erected at a cost of $25,000, of reinforced concrete and brick construction.

Numbered among the contracts awarded is one of $40,000, at Buffalo, for a new theater, let to Metz Bros., by the Co-operative Amusement Co. The same contractors have the general contract to construct a four-story business block at Buffalo for J. C. Henkel, of Corning, N. Y. Fred Gleason, Builders' Exchange, Rochester, N. Y., was the lowest bidder, at $26,200, for the construction of the new hospital at Rochester. In Syracuse the Syracuse Safe Co. will erect a $35,000 addition. The lowest bidder for the general contract is Edward K. Fenno, of the same city.

NEW YORK.

More Furnaces Will be Blown in—Structural Lettings Light.

Office of THE IRON TRADE REVIEW,
Room 1005, No. 90 West St., Aug. 24.

Pig Iron.—The market continues to show scattered advances and has now reached a level favorable for the blowing in of such capacity as has remained idle up to this time. One of the large Crane stacks will become operative before the end of the week, another Wharton furnace will blow in shortly, and several others will follow suit as rapidly as they can be gotten into shape. Foundry iron is now well established on a basis of $17, furnace, and basic at $18, delivered, either for early or first half delivery. Virginia producers have advanced to $15.00, furnace, and have taken on considerable business at that figure. Buffalo furnaces are holding at $15.75 for the remainder of the year and $16.25 for next year. Current inquiries for the most part range from lots of 1,000 tons downward, but a leading electrical interest is in the market for about 8,000 tons of last quarter iron and a few other important tonnages are being figured on. Pipe makers continue to pick up such lots as can be had and sales of the week in this connection have aggregated a round tonnage, full prices prevailing. The situation is extremely firm and is growing stronger, as is evidenced by the willingness of large producers to close promptly at figures which a pany intends to make these poles gener- We quote, New York delivery over the remainder of the year, as follows:

Northern foundry No. 1	$18.00 to 18.50
No. 2X foundry	17.50 to 18.00
No. 2 plain	17.00 to 17.50
No. 2 southern foundry	16.75 to 17.25
Malleable	17.25 to 17.75
Gray forge	16.25 to 16.75

Finished Materials.—Structural bookings continue light, though it is expected that an early decision will be reached on the Westchester inquiry, which may run as high as 30,000 tons. Local contracts include a 1,350-ton office building on William street, taken by the American Bridge Co.; a 1,000-ton apartment house in upper New York, taken by the Radley Steel Construction Co.; and a 500-ton apartment house on Seventh avenue taken by the Jones & Laughlin Steel Co. The Bethlehem Steel Co. will supply 400 tons of structural materials for the Boston Elevated and the Cambria Steel Co., and 900 tons for a draw span on the Pennsylvania at Johnstown. No decision has been reached on the Twenty-second Regiment Armory steel contract and several other local projects are near an award. During the past week, the leading interest booked about 2,000 tons and independent interests secured about 12,000 tons.

On plain materials, conditions continue much the same, though deliveries are steadily growing more remote. An inquiry for 1,000 tons of plates is in circulation and a better demand is

noted from shipyards. The weak spots in the market have been eliminated and practically all interests are now united on the following quotations:

Angles, 3 to 6 inches x ¼-inch and heavier 1.56c to 1.61c; beams, 3 to 15 inches, 1.56c to 1.61c; tees, 3 x ¼-inch and heavier, 1.56c to 1.61c; plates, carloads, tank, 1.56c to 1.61c; marine boiler, 1.86c; bar iron, 1.45c to 1.50c; soft steel bars, 1.51c to 1.56c; sheets, No. 28, black, 2.56c.

Cast Iron Pipe.—The New Bedford letting was divided, about 6,000 tons going to the Western Foundry & Machine Co. and 1,000 tons to the Standard Cast Iron Pipe & Foundry Co. The New York business noted a week ago was also divided, the United States Cast Iron Pipe & Foundry Co. securing the order for 800 tons for stock purposes and another lot of 660 tons was placed elsewhere. The leading interest also secured about 1,100 tons of pipe and specials for Brooklyn. Decidedly better inquiry is noted throughout the east and prices have advanced fully $1.00 a ton.

Old Materials.—An encouraging development of the past week has been the fact that a considerable number of mills have been inquiring for good tonnages and sales have resulted wherever round lots could be had at the market figures. A large number of dealers are working in sympathy with the joint buying arrangement prevailing in Eastern Pennsylvania. We quote, gross tons, New York delivery, as follows:

Old steel rails (rerolling)	$15.00 to 15.50
Relaying rails	19.00 to 19.50
Old car wheels	14.50 to 15.00
Old iron car axles	22.00 to 23.00
Old steel car axles	20.00 to 20.50
Heavy melting steel	15.00 to 15.50
No. 1 railroad wrought	16.50 to 17.00
Iron track scrap	14.50 to 15.00
Wrought pipe	14.00 to 14.50
Cast borings	9.50 to 10.00
Wrought turnings	11.00 to 11.50
Heavy cast scrap	13.00 to 13.50
Railroad malleable	13.00 to 13.50
Stove plate	10.50 to 11.00
Grate bars	10.50 to 11.00

Ferro-Alloys.—The past week or 10 days has witnessed an extremely heavy movement in ferro-manganese, as a result of which there has been a general advance to a minimum of $44.00, seaboard, for any delivery. The selling began at about $40.50, seaboard, practically the old price less the reduction in duty, but this figure was soon advanced and the later sales were made at a substantial increase. The Pittsburg district participated very little in the movement, which was practically all handled by one interest. A Philadelphia consumer bought 900 tons for first half delivery at slightly under $41.00 and the American Steel Foundries took 1,000 tons for shipment over the balance of the year at $40.50, seaboard. In all, the movement totaled between 8,000 and 10,000 tons. A considerable inquiry is still pending, largely for this year's delivery, but all interests are now united on the higher figure. Ferro-silicon continues rather ragged with current selling all the way from $66.00 to $69.00, Pittsburg, depending on quantity and delivery.

Iron Ore.—A moderate movement in local ores continues, the available surplus finding a ready sale at 7½c to 7¾c, delivered, per unit. Preparations are being made for the blowing in of several additional stacks in the east and some ore purchasing will be necessary in this connection. Several additional cargoes of Newfoundland ore have been sold for delivery into Eastern Pennsylvania during the balance of the year. It is also anticipated that some further selling of Spanish ore for 1910 delivery will be done.

ST. LOUIS.

Pig Iron Prices Advancing—Number of Sales of Fair Tonnages.

Aug. 23.

Pig Iron.—The pig iron market seems to be stiffening in the St. Louis territory, at least. One firm reports No. 2 southern iron for sale at $13 to $13.50, Birmingham, the former price for last quarter delivery and the latter price for the first quarter shipment, but it is doubtful if there is much iron of that grade on the market at less than $13.50 to $14 for any delivery. One large furnace company in the Birmingham district is holding firm at $14 for shipment over the remainder of the year, having withdrawn its prices of $13 to $13.50. One order of 1,000 tons of malleable Bessemer was booked last week for shipment over the last quarter of the year; inquiries are out for another 1,000 ton order of the same grade of iron for delivery over the last three months of the present year, and for still another 1,000 tons for delivery over the first quarter and first half of 1910. Another firm reports sales last week of 1,000 tons of car wheel iron and 600 tons of southern iron. The fact that so much speculative iron on the market has not not had the effect of breaking the quotations is taken as a good indication.

Northern iron is firm at $15.50 for last quarter delivery, $15.75 for first quarter and $16 for second quarter, f. o. b. furnaces, in each instance.

Our quotations for southern iron, delivered, to which the freight of $3.75 from Birmingham has been added, follow:

No. 1 southern	$17.25 to 17.75
No. 2 southern	16.75 to 17.25
No. 3 southern	16.25 to 16.75
No. 4 southern	15.75 to 16.00

Coke.—One sale of 1,250 cars of coke was reported last week for shipment over the first half of 1910. The market shows considerable more strength than during the preceding week, with the best-se ected 72-hour Connellsville foundry grade ruling at from $2.25 to $2.40, ovens, for shipment over the remainder of the year. Some foundry coke, however, can be had for immediate shipment as low as $2, ovens. Connellsville 48-hour furnace coke is offered at from $2 to $2.25 for contract shipments, while as low as $1.75 can be done for immediate delivery. Virginia and West Virginia grades are bringing from $2.25 to $2.35 for first half delivery. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Old Material.—The scrap iron market remains firm, with prices as follows:

Cast iron borings, free from foreign material, net tons	$ 5.00 to 5.50
Steel axle turnings, gross tons	11.00 to 12.00
Steel railroad axles, net tons	17.00 to 18.00
Iron railroad axles, net tons	18.50 to 19.50
Miscellaneous steel scrap, gross tons	10.00 to 11.00
Old car wheels, gross tons	15.00 to 15.50
No. 1 railroad cast scrap, net tons	11.00 to 11.50
Heavy machinery cast, net tons	13.00 to 13.50
Stove plate and light cast, net tons	10.00 to 10.50
Sheet iron, net tons, uncut	4.00 to 5.00
No. 1 railroad wrought, net tons	12.00 to 13.00
Railroad malleable, net tons	12.00 to 12.50
Heavy melting steel, net tons	11.00 to 12.00
Relaying rails, net tons	17.00 to 18.00

SEATTLE.

Reduction of Duty on Pig Iron Will Reduce Buying of American Pig Iron.

Office of THE IRON TRADE REVIEW,
302 Pioneer B dg., Aug. 20.

An exceptionally heavy movement of sheets, extensive buying of small tools and other highly finished products, mixed conditions in bar iron and steel together with slow improvement in the foundry business characterize the iron market on the Pacific coast. Sheets are selling in Seattle alone at the rate of about 650 tons per month, with very little going into stocks. Prices have not advanced, nor is any immediate change expected. The salmon catch has turned out so large that the supplies of tin cans have run short, although about 20,000 tons of tin plate was purchased for the Pacific coast salmon canneries this season.

Pig Iron.—The French bark Zinita, with a cargo of 1,000 tons of Cleve land No. 1 English pig and a shipment of

European coke, arrived on Puget Sound Aug. 19. The Zinita was 279 days out from Shields, Eng.; She was nearly four months overdue and had been given up for lost. Her arrival will temporarily relieve the scarcity of spot iron in the local market.

The reduction of the duty on foreign iron to $1.50 a ton will soon have a corresponding effect on prices in the local market and will tend to further diminish the already meager buying of American iron on the Pacific coast, although advancing European prices may soon offset the $1 reduction in the duty. Some iron is being offered for early spring delivery at attractive prices. We quote gross tons as follows: Foreign iron ex-ship Puget Sound or Columbia river, domestic, f. o. b. Pacific coast terminals:

English, Cleveland, No. 1, spot	$24.00 to 25.00
English, Cleveland, No. 1, to arrive Sept.	23.50 to 24.00
English, Cleveland No. 1, to arrive Dec.	22.50 to 23.00
English, Cleveland, No. 1, to arrive Feb.-March	21.50 to 22.50
Glengarnock, Scotch, to arrive September	25.00
Southern No. 2, domestic	23.60 to 24.00

Merchant Iron.—Bar steel has advanced slightly; the mill price is now between $2.05 and $2.10 per 100 pounds, the jobbers' price being about $2.25 on small lots, shading as low as $2.18 on attractive business. Common bar iron is cheap with little prospect of any immediate change in prices. The local bar iron mills are operating at fair capacity. It has been announced that the Irondale Steel Co. will be ready to roll steel bars at its new Irondale plant some time in October or November. We quote base prices per 100 pounds, f. o. b. Seatle as follows: Common iron bars, $2.10; mild steel bars, $2.25; machinery steel, $2.75; Norway iron, $3.50; angles, channels, zees and tees, under 3 inches, $2.75.

Sheets.—The jobbers report a very extensive business in galvanized plain and corrugated sheets. But very little tonnage is going into stocks and the demand is very well sustained. Prices are firm but are not inclined to rise. We quote, f. o. b. Seattle, as follows: Blue annealed sheets, No. 12, 2.95c; No. 14, 3c; No. 16, 3.10c; Nos. 22 to 24, 3.55c; No. 28, 3.70c. Galvanized sheets, Nos. 10, 12 and 14, 3.60c; No. 16, 3.70c; Nos. 22 to 24, 4.10c; No. 28, 4.70c.

Old Material.—Conditions in this department have changed very little since the last report. The foundry buying is being fairly maintained, but consumers do not anticipate further advances in the price of foundry scrap on the North Pacific coast. The quality of material being offered at present is somewhat below grade and it is difficult to obtain clean carloads of strictly first class foundry scrap. We quote in net tons, f. o. b. Seattle, as follows:

Foundry and machinery scrap	$19.00 to 20.00
Old car wheels	16.50 to 17.00
Railroad wrought	10.00 to 11.00
Country wrought and busheling	5.00 to 8.00

BRITISH IRON MARKET.

Favorable News From America Still Has Strengthening Influence.

Office of THE IRON TRADE REVIEW, Prince's Chambers, Corporation St., Birmingham, England, Aug. 14.

Several circumstances have combined this week to maintain the improvement reported a week ago. The continuance of favorable news from America exerts a strengthening influence on the British markets, where it is generally regarded as indicating a genuine revival. It is felt that while no substantial increase in the American demand can be looked for this year, the altered conditions are not to be ignored. Another influence for good is afforded by signs of increased activity in the general trade of this country. The immediate effect of the stronger tone has been to induce buyers, who have previously held off the market in the hope of obtaining better terms, to place orders. They have apparently realized that no further slump in prices can be expected and are eager to avail themselves of the present comparatively low figures rather than run the risk of having to buy at largely increased rates, should the upward tendency continue. For Cleveland No. 3 the highest price recorded for the year has been touched this week, the figure being 50s ($12.24), an increase of 3d on the week. The tonnage of iron in store at Connal's is 264,556, an increase on the year of 209,841; stocks on Aug. 13, 1908, totalling only 54,715 tons. A more active demand is reported from Middlesbrough, and it is considered an extremely good sign that among the buyers are numbered some of the keenest of business men. The East Coast hematite trade, which has for so long been in the throes of a depression, displays signs of recovery, buyers showing more disposition to do business. In this department, also, it seems to have been recognized that it is impossible for prices to reduce further. Producers, who are among the most favorably situated, are known to have been selling at prices which can have yielded the barest profit. Quotations are still at 55s ($13.46) and it will be realized how depressed trade has been when it is borne in mind that hematite, to maintain its proper relationship, should be 10s higher than Cleveland pig, whereas the difference is only a matter of 5s. Shipments of pig iron from the Cleveland district are also improving. The total of the exports for last month was 36,162 tons, compared with 31,845 for the previous month, and 33,297 tons for August, 1908. The Midland market on Thursday reflected the upward tendency shown by other markets, pig iron prices being raised in some cases as much as 1s per ton. Inquiries were numerous, but the advance would seem to indicate not so much a desire for increased profit as disinclination to dispose of iron while the market shows a rising tendency. Generally it may be said, that the most sanguine hopes are entertained that a not very distant future will see a revival which will place the markets on an equally firm footing with that of the time which immediately preceded the slump.

GERMAN IRON MARKET.

Bar Iron for Export Nets Makers Only About $20 Per Ton.

Dusseldorf, Aug. 9.—The tendency of the market is still very far from any improvement. Pig iron is again weaker and strongly offered till the end of 1910, but buyers are shy and follow a cautious policy. The last small contracts that have been made for delivery till the end of 1910 are at 54 marks ($12.90) per 1,000 kilograms at producer's works for best hematite. The quotations for foundry No. 1 and 3 are nearly the same as for hematite. Coke is firm in price at 16.50 marks ($3.90) per 1,000 kilograms at mines, but the production remains far greater than the consumption, hence a continued increase of the stocks.

In finished and half-finished materials, orders are more numerous, but prices remain very unsatisfactory and producers are bound to lose money. Bar iron for export is quoted today at even less than 90 marks ($21.40) per 1,000 kilograms (2,205 pounds) f. o. b. Antwerp. Deducting the freight from the works to Antwerp, the costs for reshipment at Antwerp, commissions, etc., there are hardly 84 marks ($20) per 1,000 kilograms at works left to the makers.

The prospects in this country are not encouraging. Heavy new taxes and duties will press upon the industry generally, the political situation in the inland remains uncertain and there is no doubt that the money market will again become firmer in the late autumn.

In the general opinion there is only

one thing which could help us to a serious improvement and that is a great demand from America for pig iron, rails, etc. However, we see that the situation in the states is far better than previously, but that it is not yet so as to create a great and serious demand for continental iron and steel products.

METAL MARKETS.

CHICAGO.

Aug. 24.

There has been only a fair volume of business done in this market. Considerable inquiry for copper is reported, but without much tangible result in the way of sales; buyers seem to lack faith in the market. Casting copper has been scarce. A good business has been done in lead, at strong prices. Tin has been strong, speculatively. Spelter shows a slightly wider spread. We quote as follows:

Lake copper, carload lots, 13⅝c to 13¾c; casting copper, 13¼c; smaller lots, ¼c to ¾c higher. Spelter, 5.70c to 5.85c; lead, desilverized, 4.40c to 4.45c in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, $7.50 list f. o. b. LaSalle in car lots of 600-pound casks; pig tin, 31½c to 32c; Cookson's antimony, 10½c; other grades, 9¾c to 10¼c.

Old Metals.—Trade continues to present only warm weather conditions, and the amount of business is at the minimum. Our figures this week represent dealers' selling prices, and hereafter our quotations will be made on that basis. We quote dealers' selling prices, as follows:

Copper wire, 13¼c; heavy copper, 13c; light copper, 11½c; heavy red brass, 12c; heavy yellow brass, 9½c; light brass, 6¾c; No. 1 red brass borings, 10c; No. 1 yellow brass borings, 7¾c; brass clippings, 9½c; tea lead, 3.60c; lead scrap, 4c; zinc, 4½c; tin pipe, 29c; tin foil, 27c; pewter, 20c; electrotype plates, free from wood, 4¼c; electrotype dross, 2.75c; stereotype plates, 4½c; stereotype dross, 3¼c; prime slab zinc dross, $70 per ton.

ST. LOUIS.

Aug. 23.

Lead and Zinc.—The highest price paid for zinc ore in the Missouri-Kansas-Oklahoma district last week was $54 for one bin on an assay base of $52.50 for 60 per cent zinc, being $1.50 a ton higher than the preceding week's high price of $52.50—the top price for the year. The prevailing basis throughout the district was $50 to $51.50 a ton, with a base of $48 for some ore sold early in the week. The top quotation was within $6 of the highest price ever paid for zinc in the district, and record-breaking sales are anticipated within the next few weeks. Some of the heaviest producers are selling their surplus of ore with considerable reluctance, showing that they expect a steady gain in prices. The surplus of 1,700 tons held by B. C. Aylor in the Prosperity camp more than three years has been withdrawn from the market until a $60 base price is reached, it is reported. The ore is said to be low grade, and on a $60 base would bring about $56 a ton, or a total of $95,200. The ore was produced from the Gobbler mine on the property of the Eleventh Hour Mining Co. The mine has been shut down for several years, but resumed operations last week. The ore pile is the largest ever accumulated in the district. The total valuation of the ores sold in the district last week was $315,053, with calamine ores strong in quantities and values. St. Louis spelter was firm Saturday at $5.70.

Lead ore prices, which rose to $60 at the close of the preceding week, remained firm at that figure throughout the last week. The sales were heavy. St. Louis pig lead was quoted at $4.25 Saturday. The best base price obtained for calamine was $28 a ton. Choice lots sold as high as $35 a ton. The market was strong. The surplus of ores in the district has been materially reduced with the exception of the large bins that are held for higher prices.

NEW YORK.

Aug. 24.

Copper.—Although the market has quieted down considerably from the activity noted a week ago, inquiry continues vigorous and the price level is firm as follows: Lake 13¼c to 13⅜c; Electrolytic 13⅛ to 13¼c; Casting 13c to 13⅛c; on the New York Metal Exchange standard metal is quoted as follows:

Spot	12.65c to 13c
August	12.65c to 13c
September	12.65c to 12.85c
October	12.70c to 13c
November	12.85c to 13c
December	13c to 13.05c

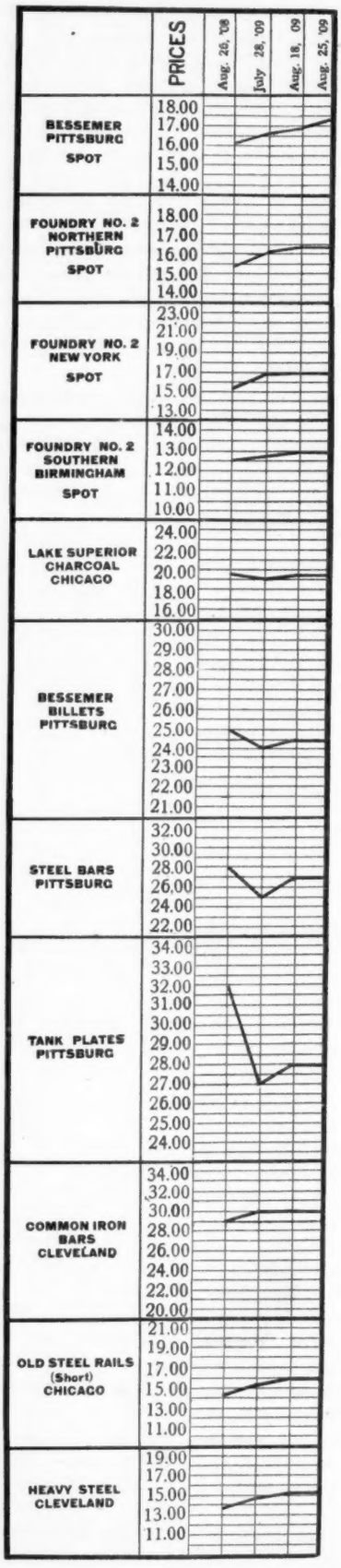
Pig Tin.—There is little buying for requirements ahead of the immediate future, but the speculative factor continues to exert an important effect on the market and the current price is 30c or slightly higher.

Pig Lead.—A steady increase in demand is to be noted and several of the largest sellers have increased their prices to 4.40c, New York. The range is still given as 4.37½c to 4.42½c.

Spelter.—Largely because of the ore situation, the price level continues to advance and is now quoted, New York delivery, at 5.77½c to 5.82½c.

Antimony.—We quote Hallett's at 8¼c; Cookson's 8½c and other brands at 7¾c to 8c.

PRICE CHART.



STRIKE FATALITIES.

Seven Killed Outright In Riot of Workers at Schoenville.

The most serious outbreak of violence that has attended the strike at the plant of the Pressed Steel Car Co. at McKees Rocks, Pa., occurred Sunday evening, Aug. 21, in the streets of the industrial town of Schoenville, where the men live. Street cars in which deputy sheriffs and several state troopers were riding were set upon by a mob of the strikers and when the occupants refused to obey the commands of the crowd to leave the cars, a pitched battle ensued in which hundreds of shots were exchanged. A detachment of the mounted state troops stationed at the steel car plant some distance away came to the rescue of the besieged men in the cars and succeeded in dispersing the mob only after a bloody battle which was stubbornly fought for some minutes. Two troopers, a deputy sheriff and five strikers received bullet wounds in the fight which caused their death, and a score of others were injured, some of them probably fatally. As a result of the bloodshed, Governor Stuart, of Pennsylvania, ordered a second troop of the state constabulary to the scene and the territory about the plant of the Pressed Steel Car Co. is now practically under martial law. Extra precautions are being taken to prevent a recurrence of a desperate outbreak and numerous arrests are being made daily by the troopers. The plant of the car company is now operating at part capacity with a force of workmen which has been brought from other cities.

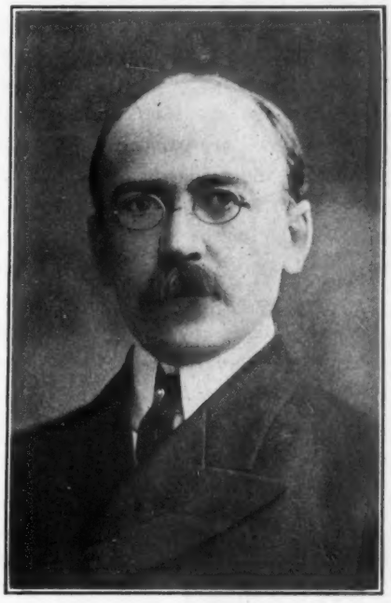
YOUNGSTOWN CONCERN TO MAKE IMPROVEMENTS.

At a recent meeting of the directors of the Youngstown Foundry & Machine Co. the company decided upon important improvements in order to meet the demands of its increasing roll business. The foundry located on East Boardman street, which has been idle for some time, is to be completely overhauled and made into a plant for the manufacture of sand and chilled rolls. The main building is already equipped with three electric traveling cranes and the company proposes to install one 25 and one 15-ton air furnace, a 25-ton cupola, a number of roll lathes and other machinery, which the company believes will place it among the foremost roll manufacturers of the country, both of rolls for sheet and tin mills and for other purposes. The concentration of roll manufacture at the Boardman street plant will give the company additional capacity at the Reserve street plant for the manufacture of castings for rolling mills and blast furnaces and for rolling mill machinery.

The new officers of the company are: W. J. Wallis, president and general manager; F. A. Williams, vice president and sales manager; B. G. Parker, secretary and treasurer.

CHANGES IN REPUBLIC OFFICES AT PITTSBURG.

Severn P. Ker, vice president and general manager of sales of the Republic Iron & Steel Co., has resigned, to take effect on Oct. 1, next. Chas. T. Johnston, assistant general manager of sales, will succeed Mr. Ker as general manager of sales, George L. Claypool, at present manager of sales of the Pittsburg district, succeeding Mr. Johnston as assistant general manager of sales. Walter W. Hall, assistant in the general sales office, will become



Severn P. Ker.

manager of sales of the Pittsburg district. These appointments all becoming effective as of Oct. 1, next.

Mr. Ker has acquired a large interest in the stock of the Sharon Steel Hoop Co., and will, on Oct. 1, become associated with that company in the capacity of general manager. Upon assuming this position, Mr. Ker will be located at the general office of the Sharon Hoop Co., at Sharon, Pa. It is the purpose of the Sharon Steel Hoop Co. to broaden its field of operations and to develop particularly in the line of high grade specialties. Mr. Ker was invited into the organization because of his long experience in connection with the manufacture of high grade steel specialties, acquired during his 15 years' connection with the firm of Smith Bros. & Co., later the LaBelle Steel Co., at their plant in lower Allegheny, which, upon the organization of the Crucible Steel Co. of America, was merged into that company.

LAKE SUPERIOR MINING INSTITUTE.

The Lake Superior Mining Institute is in session this week with headquarters at Ishpeming, Mich.

The following papers have been announced for presentation at this meeting:

How Reforestation May be Applied to the Mine Timber Industry, by Thomas B. Wyman, Munising; Mine Accidents, by John T. Quine, Ishpeming; The Sociological Side of the Mining Industry, by W. H. Moulton, Ishpeming; Biographical Notes, by J. H. Hearding, Duluth; Reminiscences of the Early Days on the Marquette Range, by George P. Cummings, Marquette; Historical Sketch of Copper Mining on Lake Superior, by Alfred Meads, Marquette; Code of Mine Signals, Cleveland-Cliffs Iron Co., by O. D. McClure, Ishpeming; Capillary Attraction in Diamond Drill Test Tubes, by J. E. Jopling, Ishpeming; Sinking Reinforced Concrete Shafts Through Quicksand, by Frederick W. Adgate, Chicago; A Diamond Core Section of the Mesabi Rocks—No 1, by N. H. Winchell, Minneapolis; Wood Preservation With Especial Reference to Mining Timbers, by John M. Nelson, Jr., Washington, D. C. (U. S. Forest Service). Iron Ore and the Tariff, by H. Olin Young, Ishpeming.

Furnaces Blowing In.—The Neville furnace of the Carnegie Steel Co., located on Neville Island near Pittsburg, has been blown in, making 52 of the 59 stacks of the company now in blast. This furnace, which was acquired from the American Steel & Wire Co. through a trade for the Donora stacks, has not been operated for the past several years. The No. 1 Columbus furnace is expected to go on this week to be followed shortly by the Edith on the North Side, Pittsburg; and the No. 2 Columbus. Orders have also been given to place the Niles, O., furnace, an isolated stack, in shape for iron making.

New Basic Furnace.—The Sharon Steel Hoop Co., Sharon, Pa., has awarded contracts for an additional 40-ton basic open hearth furnace which, when completed, will give the company a working capacity of six acid and basic furnaces. The company is broadening its producing and selling activities and has other improvements in contemplation for its plant.

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August 26, 1909.

GROWTH OF THE ALUMINUM CASTING INDUSTRY.

Attention is directed to the rapid growth of the aluminum casting industry by the announcement of the consolidation of six of the largest aluminum foundries in the country. Less than 10 years ago, the casting of this metal was still in an experimental stage, and the knowledge of its behavior in sand molds was an unknown quantity. Having a low melting point and being easily melted in a cast iron pot, if no crucibles were at hand, the production of castings from this metal proved exceedingly attractive to many foundrymen. Furthermore, the exceedingly high prices that prevailed, ranging from 80 cents to $1.25 per pound, were the magnets that drew many founders into this line of work. At that time, however, it was not generally known that this metal was easily affected by the oxidizing influences of the melting flame, and the difficulties encountered after losses more or less heavy had been sustained resulted in centralizing this work in a few shops where a specialty was made of this line of work. Today, provided the metal is properly handled, not only in melting but in the molds as well, little trouble is experienced from the difficulties encountered in early practice. Owing to its lightness, this metal has entered largely into automobile construction, and parts not subjected to severe strains are now made from it. Aluminum crank and gear cases of the most intricate design are successfully cast. The high shrinkage is overcome by the judicious use of risers, and many chills are also placed in the molds.

The growth of this industry has been coincident with the expansion of the automobile trade, and it has been asserted that the six plants consolidated will consume approximately 8,000,000 pounds of aluminum per year. This concern will be by far the largest user of aluminum in the world, although a large outlet for this metal is found in steel works, where it is extensively used.

Several large orders for aluminum castings have been recently placed, one involving 30,000 crank cases for delivery during the next nine months, while another provides for 12,000 castings. With the decline in the price of aluminum and the improvement in the foundry manipulation of this metal, the cost of castings has been reduced to approximately 35 cents per pound.

The growing use of malleable castings in the construction of automobiles is also interesting to note in this connection. Many forged sections are being replaced by malleables, and, in one car of popular price, malleable sections are being used in preference to brass and bronze castings and forgings, owing to their low cost.

SOLID FOUNDATION FOR PROSPERITY.

One of the several interesting features which have marked the present upward movement in the iron and steel trade is the almost entire absence of speculative buying. When the open market on finished products was declared in the spring and prices reduced to a basis that represented actual costs, every effort was made by the steel manufacturers to eliminate some of the evils of previous active buying movements. Large tonnages for finished products, that in part at least included visionary requirements, were scaled down to actual needs, and with the exception of the agricultural implement interests, few contracts were entered into for deliveries extending beyond Jan. 1, 1910.

Results, gratifying to consumers and producers alike, have followed the adoption of this plan. Tonnage on mill order books now largely represents specifications for material for early shipment, and the belated buyer is afforded an opportunity of providing for his wants with an assurance of a rolling date considerably earlier than was possible under the old methods.

Another evil from which the mills have suffered in the past, especially on a declining market, was the refusal of consumers to specify on the undelivered tonnage of their contracts with result, that, in many cases, producers suffered severe financial losses on the raw materials purchased to cover these orders. On the other hand, consumers often complained bitterly that mills would not deliver promptly on contracts after the prices had advanced.

A number of the leading interests are now refusing to quote on material for shipment after Oct. 1, and there is a strong sentiment against making long time contracts, which are merely options to buy.

The absence of uniform quotations on steel products since the open market was declared is another distinct departure that has proved satisfactory. On steel bars, plates and structural shapes there have been in the past six months, differences in prices of at least $2.00 a ton, but this gap, owing to the constantly growing demand, is being rapidly closed and the variation is now only $1.00 a ton, except in the few cases of high prices being paid for immmediate shipment. In making recent advances there was no concerted action among the manu-

facturers, and values today reflect conditions in the steel trade.

On the whole, the iron trade is now on a more solid foundation for continued prosperity than ever before in its history. It would seem that nothing short of reckless folly could shatter that foundation.

UNWISE OPPOSITION TO REGULATIONS.

The *Financial Chronicle* of New York, a very ably edited journal, having extremely conservative views, is perturbed by a recent interview of Senator Burton of Ohio, advocating a greater use of the natural water ways. Senator Burton said that capitalists are deterred from investing in river transportation lines for the reason that railroads will drive the boats out of business by making rates between competitive points so low that the water lines can not make a profit. He proposes as a remedy the enactment of a law by congress which will fix minimum freight rates for interstate traffic so as to insure a reasonable profit to the carriers whether the transportation be conducted by rail or by water.

"If," says the *Chronicle*, "the tactics suggested by Senator Burton are practiced by the railroads, then it appears that transportation companies have adopted a method which is quite commonly in use by corporations in the ordinary pursuits of life. It was shown some time ago by testimony in court that it was not uncommon for the Standard Oil Co. to reduce the price of refined oil so low that competitors would be compelled to withdraw from the field. Such methods are so common that they may be said to be practiced in every branch of trade. It is one of the results of competition, whereby for a time the consumer is benefited. That a principle so universally adopted should be applied by the railroads when their managers deem that it is necessary to make use of it in order to retain traffic, is not at all surprising. But why should a railroad company not be allowed to defend itself and protect its business by the same methods that are utilized in every other branch of business?"

We do not know whether Senator Burton's plan would be entirely practical or not but it seems to be reasonable, and we believe that the railroad companies will make a serious error if they base their opposition to it on the ground that they ought to be allowed to ruin competitors if they can do so. In the long run, the consumer gains nothing by ruinous competition, and it certainly is not in accord with sound public policy for the law to permit it. There is a tremendous sentiment in this country in favor of the reasonable regulation of public and quasi-public corporations. During the past year, this sentiment has not been so actively expressed as during the preceding two or three years, but it exists just as strongly as it ever did. Nothing is more certain to result in its violent expression than is opposition to all regulation.

A few days ago, a representative of what is commonly known as the theatrical trust made a speech in which he told a story of an alleged incident that occurred during the landing of Noah's Ark. As the elephant was going ashore, a mosquito alighted on his back, and the elephant turned around and said to the mosquito, "Stop your shoving, I've got to get out first, but I will take you along with me if you behave yourself." Talk of this kind is not the kind that will satisfy the public or quiet agitation in favor of reasonable regulation of corporations any more than will the more dignified opposition of the *Chronicle*. If the elephant does not behave himself, the public may do a little shoving itself.

LARGE TONNAGE OF SCRAP PURCHASED.

(Special Telegram).

Seattle, Aug. 24.—The Pacific Hardware & Steel Co., Seattle, Wash., has purchased 20,000 tons of soft steel piling scrap from the Western Iron & Steel Co., San Francisco, the consideration being about $10 per ton. It is understood that the iron will be rolled at Portland.

NEWS OF THE GREAT LAKES.

Dry Dock and Shipbuilding Plant to be Built at Port Arthur.

The voters of Port Arthur, Ont., have ratified the agreement between the city council and the Western Dry Dock and Ship Building Co. for the establishment of a dry dock and ship building plant at that port. Work is to be begun within two months and is to be completed by Sept. 1, 1911. By agreement the dry dock is to be capable of receiving the largest vessels on the lakes and the plant capable of constructing them. At least 300 hands must be continuously employed. A site of 100 acres has been dedicated to the company along with suitable water frontage on Thunder bay. All of the property is to be exempt from taxation for 20 years with the exception of school taxes, which are fixed at $2,000 per annum. For the first ten years the company will receive an annual cash subsidy of $25,000 subject, however, to the employment of 300 hands. If less than 300 are ever employed, the subsidy will be reduced in proportion. No part of the subsidy can be expended for establishment of plant; it must all be devoted to operation. It is the general understanding that the company will lay out about $1,000,000 on the plant, though no sum is stated in the articles of agreement.

Ore shipments continue very heavy and the movement for August is expected to exceed 7,000,000 tons, which will constitute a record. In fact, the present fleet could handle 8,000,000 tons a month, if necessary. Wild carriers are in better demand and, as it is the intention of shippers to move all the ore that can be mined during the remainder of the season, vessels will be very busy. Grain chartering for October is on the basis of 75 cents for ore; that is to say, 2 cents for wheat.

The steel steamer Senator, which was in collision with the steamer Norman B. Ream at Detour, is lying abreast of Pipe Island, badly broken. She will probably be out of commission during the rest of the season.

The Lorain yard of the American Ship Building Co. made excellent dispatch on the steamer J. S. Ashley. The keel was laid on June 1; she was launched July 31 and left Lorain with a cargo of coal aboard Aug. 25, a matter of eighty-six days. This is not the record for construction by any means, but nevertheless is very creditable.

GROSS PROFIT FALLS.

Republic Iron & Steel Shows Big Surplus Notwithstanding.

The annual report of the Republic Iron & Steel Co. shows that the gross profit of the company for the year ending June 30 was $2,769,147 against $4,046,689 in 1908, $6,127,741 in 1907, and $4,750,476 in 1906. This year's profit is the lowest in the history of the company, but this year the company set aside only $726,322 for depreciation, interest, discount, etc., against over $2,000,000 in each of the three preceding years which, with the deferring of the preferred dividend, allowed the company to show a surplus of $1,221,008 against $899,533 last year. The company's surplus now stands at $5,920,535 and the net profits applicable to dividends are $1,629,346.

In explaining the report, John A. Topping, of the executive committee, says:

"During the year ended June 30, 1909, income was not only affected by labor troubles of a serious character, but by a period of low prices and a restricted volume of business.

"Prices of all products steadily declined throughout the year, with the average for May at the bottom, so that a period of business depression seldom if ever, exceeded in severity. The general average volume of all products sold during the year was, approximately, 62 per cent of normal; but notwithstanding the small volume of business, the general cost of production was the lowest for the period in the history of the company, although labor rates were in excess of the company's minimum record.

"To summarize results, it might be stated that the policy of the executive committee, of liberal expenditures of earnings for property maintenance and betterment, has, in combination with an efficient and harmonious organization, maintained the company's earning capacity on a gratifying basis during the trying period of stress."

The gross volume of business showed a small increase over that of 1908 and the pig iron production, 678,799 gross tons, was the largest in the history of the company. The production of finished and semi-finished material was 565,151 tons which was about 100,000 tons above the year before, but about 250,000 less than in 1907. The company added 1,156,005 tons to its ore reserve in addition to year's production.

The unfilled orders for finished and semi-finished products amount to 392,420 tons as compared with 283,743 tons at June 30, 1908. The unfilled orders for pig iron amount to 94,247 tons as compared with 59,196 tons in 1908; 74,500 tons in 1907, and 74,607 tons in 1906.

PERSONAL.

R. V. Van Cortlandt, one of the directors of the Southern Iron & Steel Co., has gone for a six weeks' tour in Europe.

W. C. Runyan, president of the Struthers Furnace Co., Cleveland, returned Tuesday from Europe on the Kaiser Wilhelm II.

Rush Hill, chief engineer of the Great Northern Ore Lands Co., Chisholm, Minn., has resigned to take up consulting work in Mexico.

C. T. Fairbairn, Duluth, has been appointed manager of the mining division of the Republic Iron & Steel Co. He was formerly manager of the mines for that company in the Lake Superior district.

Charles M. Power, secretary and general manager of the Seneca Chain Co., Kent, O., has resigned and has become associated with the Standard Chain Co., as general sales agent with headquarters at Pittsburg.

J. V. W. Reynolds, vice president of the Pennsylvania Steel Co., who has been in Europe for several months, left Bremen for New York on the George Washington, Aug. 21, and is due in New York Aug. 29.

Senor G. Dominico, one of the officers of the Argentine National Railway Co., was a recent visitor to the plant of the Tennessee Coal, Iron & Railroad Co., at Ensley, Ala. The company which Senor Dominico represents has placed an order for steel with the Tennessee company.

Edmund C. Harder, of Milwaukee, graduate of the University of Wisconsin, '05, is co-author with E. F. Burchard and Sidney Paige, of a chapter on iron and manganese steel, issued by the geological survey as part of the Economic geology series.

John Bobenberger, 704 Holton street, Milwaukee, Wis., who was elected second vice president of the Master Sheet Metal Workers at the annual convention in Louisville, is vice president and contracting agent for the Consolidated Sheet Metal Works, 61-673 Hubbard street, Milwaukee.

F. C. Armstead, supervising engineer of the stoker department of the Westinghouse Machine Co. who, for a number of years has been located at East Pittsburg, Pa., has moved his headquarters to the Westinghouse works, Attica, N. Y., where the stokers are manufactured.

W. B. Graham, salesman with the Carnegie Steel Co.'s Cleveland office, will become connected with the United States Steel Exports Co., New York City, Sept. 1 and will be in charge of the exports of the Lorain Steel Co., of which company he was the Cleveland representative for a number of years.

G. H. Griffiths, of the Toowoomba Foundry Co., Brisbane, Queensland, Australia, is making a tour of this country, inspecting various industrial plants. He has been in the United States about two months, and. in the east, has visited among other plants, the Henry R. Worthington Works, of the International Steam Pump Co., at Harrison, and the shops of the Pratt & Whitney Co., at Hartford, Conn. Among western plants he visited, and in which he showed much interest, were the McCormick works of the International Harvester Co., and the Henry E. Pridmore molding machine works, at Chicago.

RILEY MILES GILBERT DEAD.

Riley Miles Gilbert, the dominating factor in King, Gilbert & Warner, Columbus, O., for many years very successful producers of iron and steel, died Sunday, Aug. 22, at his summer home at Bolten's Landing, Lake George, N. Y. Burial was at Woodland cemetery, New York city, Aug. 24. Mr. Gilbert was about 60 years of age and had been retired from active work since 1891. It was his company which built up the steel works at Columbus, which are now a part of the United States Steel Corporation. These works went into one of the first combinations, the National Steel Co., of which Mr. Gilbert became vice president, serving until it was acquired by the Carnegie Steel Co. He accumulated a large fortune and was one of the powers in the steel world of the 80's and the 90's.

Cornelius Kendall died in Toledo, Sunday afternoon, Aug. 15. Mr. Kendall was vice president of the Shaw-Kendall Engineering Co.

Long Length Pipes.—The National Tube Co. is now manufacturing at its McKeesport works 6 and 8-inch lap-welded steel pipe in 40-foot lengths. Included in the extensive improvements which have been made to this plant is a double length lap-welded furnace which permits of the manufacture of lap-welded pipe in the extreme lengths. The ordinary length of this tubular product has been about 20 feet although butt-welded steel pipe has been made in 40-foot lengths for a number of years.

KRUPP'S SECRET

COST THE GOVERNMENT MANY MILLIONS,

But is No Longer of Importance—Three Steel Companies Will Share in Armor Contracts.

Washington, D. C., Aug. 23.—When bids for $5,500,000 worth of armor plate for the battleships Arkansas and Wyoming were opened at the navy department this week, it was found that the three armor producing concerns of this country had submitted propositions so nearly identical as to make it practically certain that the contract will be divided equally among them. The Midvale Steel Co., of Philadelphia, the Bethlehem Steel Co., of South Bethlehem, and the Carnegie Steel Co., of Pittsburg, each bid $420 a ton for class A, or Krupp armor. As this class comprises the bulk of the armor desired by the government, 11,486 tons, the fact that the bids varied somewhat upon classes B, C, D and E, of which only about 1,500 tons is wanted altogether, will make little difference. It being the policy of the navy department to give each armor plant a part of every contract unless there is too great discrepancy in the bids, it is probable that in this case the contract will be divided into three as nearly equal parts as possible.

It is remarked that the Midvale Steel Co., which entered the field as a competitor of Carnegie and Bethlehem in 1907, by underbidding them very materially, has put its prices up to those of the other two concerns. The first bid of the Midvale company was $398 a ton for class A armor, and other classes in proportion. From that price it subsequently went up to $400, then to $410 and now to $420 a ton, the price that has been maintained throughout by Carnegie and Bethlehem for Krupp armor. When Midvale first bid for armor contracts, it had no armor plant and had not made a ton of this product so far as known. But it agreed to establish a plant and filed a bond for the faithful performance of any contract awarded it. The navy department allotted it but a minor portion of the full contract, although it was the lowest bidder. It made its deliveries on time and its product came up to the specifications and tests.

Millions Saved.

Thus while the advent of the Midvale Steel Co. into the field has not resulted in a lower nominal price for armor, it has caused a saving of millions of dollars to the government through the abrogation of the payment of royalties on Harveyized and Krupp armor. These processes were controlled in this country by the Harvey Continental Co., and the right to use them was held exclusively by the Bethlehem and Carnegie companies. The Harvey was a patented process, but the Krupp, while depending to some extent upon patents, was protected principally by the secrecy that was observed by its founders, the Krupp works at Essen. Companies acquiring the right to use the Krupp process sent expert workmen to Essen, who were there instructed in the details and sent back to their home mills under the strictest pledges of secrecy.

In addition to the prices the government paid the Carnegie and Bethlehem companies for armor, they paid a royalty of $45 a ton on all they purchased made by the Krupp process and $11.20 a ton on all made by the Harvey process. When the Midvale company bid on its first contract it put in no provision for royalties and this proposition had to be met by the other two concerns. Since that time, the government has not paid a dollar of royalties for the use of either process and really has no official knowledge whether either of these processes is now employed. All the department is concerned about is getting armor that will stand the tests prescribed.

Secret No Longer.

It is evident, however, that the Krupp secret, which was so carefully guarded since its discovery in 1895, is a secret no longer. Either it is out or else the Krupp process of hardening steel plates has been superseded by some other equally effective. Speculation ran rife, unofficially, in the navy department, as to how the Midvale company expected to make Krupp plates when the Krupp process was controlled by other concerns, and much doubt was exhibited on this point, as was evidenced by the small portion of the initial contract allotted to Midvale. But the new bidder proved able to comply with the specifications in every respect and from the first test at Indian Head it was evident that by whatever process the plates were made, Midvale was able to make armor fully as good as the Krupp. The result is that the tribute paid to foreign genius by this government has been cut off and the money saved to the public.

Just what the Krupp secret was is not yet known to the experts of the navy department, though it has always been suspected that the success of the German makers was due to methods rather than to alloys used. Nickel and chrome were introduced into the plate in practically the same quantities as were used in the Harvey process but there was another alloy which could not be ascertained. Harvey armor was face-hardened by placing it in contact with charcoal, under a high and prolonged degree of heat, and this put a very tough surface on it, but only to a depth of from 1 to 1¼ inches. This was considered a very advanced step in armor making until 1895, when the Krupp people discovered their process, by which super-carburization was accomplished by means of hydrocarbon gas. In this manner the plate could be hardened to any depth desired and as soon as it was demonstrated to be feasible every nation was eager to secure the process or armor made by it. Thereafter the United States navy department prescribed that all plates above 5 inches in thickness should be of Krupp armor and those of 5 inches or less of Harveyized armor.

How the Midvale Steel Co. obtained the Krupp secret is still a mater of general speculation in the navy department. Ordnance officers, while protesting that they have no interest in the question officially, being concerned solely with getting armor that will stand the tests, still have the curiosity of other men. They are pleased with the advent of the Midvale company into the field because of the great saving to the government that has resulted and also because another armor-producing establishment has been built that increases the available armor supply in a war crisis.

ARTHUR J. DODGE.

FOUNDRY DAY AT THE A.-Y.-P. EXPOSITION.

September 6 will be Foundry Day at the Alaska-Yukon-Pacific Exposition. The program for the day, as announced by the United Metal Trades Association of the Pacific Coast, includes a cupola demonstration in charge of J. H. Linton, consulting foundry specialist, who will cast in one heat gray iron and semi-steel, the semi-steel mixture to be made up from bolts, boiler tubes, wrought iron, punchings, borings, etc. Three types of molding machines, rock-over, stripping plate and squeezing, will be seen in operation. There will also be a demonstration of the Sly cinder mill for recovering iron from the cupola drop. In the Steele-Harvey brass furnace, A. W. Gregg will melt manganese-bronze showing a tensile strength of 70,000 pounds per square inch.

The afternoon will be devoted to machine shop demonstarations, including the forging, tempering, grinding and use of high speed steel. The program will commence at 9:30 a. m. and conclude at 5:00 p. m.

BRITISH TRADE RECOVERING.

Signs of Better Times Appear in Railway and Industrial Circles.

Office of THE IRON TRADE REVIEW, Prince's Chambers Corporation St., Birmingham, England, Aug. 14.

Trade recovery is becoming more and more each day the theme of articles in the British papers. The *Statist* remarks for instance, that all the conditions are favorable to improving trade and to an increase in profits and dividends. In support of this it refers to the promising conditions of the world's crops, both in the eastern and western hemispheres, and says that the beneficial effect of a very largely increased food supply, of which there is a prospect during the next twelve months, cannot be exaggerated. Already dividends have begun to recover from the decline they experienced last year. In this country we have had during the past fortnight a series of recoveries in railway dividends, a recovery which the *Statist* believes likely to continue for several half years to come. The prospect of a further recovery in the second half of the current year is said to be specially favorable. "Moreover," the *Statist* adds, "the recovery in dividends will come about, not so much because of economies in expenditure as because of continued growth of traffic, and the probability that the new traffic may be dealt with in an economical manner."

The statement with regard to railway dividends requires some qualification though happily this qualification has in it an element of encouragement from an iron and steal trade point of view. Whatever may be the case with regard to dividends in the immediate future, there is no doubt that the fact of railway dividends during the past year or two having been better than might have been expected, is attributable in a large measure to restriction of expenditure. The dividends, in fact, as is shown by the state of the storage departments of the railways, have been kept up largely by economies in works and purchases. The deduction may fairly be made from this that with increasing receipts and increasing traffic the companies will very shortly be compelled to make large purchases of stores and rolling stock and will be encouraged to proceed with many delayed reconstructions and extensions of lines, stations, and goods departments. Thus, makers of structural steel and other manufacturers may hope during the next few months to see a rapid increase in business from the railway companies.

A commencement has been made in the erection of new works at Middlesbrough, to be known as the Ormsby Rolling Mills. The site is on the banks of the Tees close to the Cargo Fleet Works, and is ten acres in extent. The new mills, which are being erected by the Ormsby Rolling Mills Co., Ltd., are for the production of rolled steel and will be in operation early next year.

LAND FOR SHOPS.

Southern Pacific Buys Property Near San Francisco.

San Francisco, Aug. 20.—California is soon to have a large railroad shop on the plan of eastern towns in which extensive shops are located. The Southern Pacific Co. is making preparations to move its shops to Newark, Alameda County, 30 miles from San Francisco and less than five miles from the southern arm of the Bay of San Francisco. That place is destined to become a huge workshop for the Southern Pacific and for other railroad companies. The freight yard, switch yards and auxiliary shops will remain in their present location, San Francisco. The company has recently acquired 525 acres in Newark, where it owned 400 acres, giving it 925 acres, sufficient to hold all its shops and accessories and leave enough room to build dwellings for its workmen. The location is said to be admirable for the purpose.

Steel motor and passenger cars will be used entirely on the electrified suburban lines of the Southern Pacific Co. At a conference between the executive and operating officers of the company that decision was reached, and a contract will be let shortly calling for equipment costing $1,000,000. This is merely an initial order for about 100 motor and passenger cars, while the total cost of changing the system will amount to more than $3,000,000. Instead of the electric locomotive the combination motor and passenger coach will be used, each car seating about ninety passengers.

While it must be admitted that San Francisco has accomplished marvels in rebuilding the destroyed section of the city in three years, it is also true that there are many vacant spots, even square blocks, in what were formerly the most populated district. The city is being built up in the outlying districts and filling the suburbs, while the sections close to the business centers, which were densely populated before the fire of 1906, are almost entirely deserted. The change is due to the extension of the fire limits. Owners can not afford to build dwellings of concrete or granite in the side streets close to the wholesale, manufacturing, or retail districts, where people of moderate means prefer to dwell, and the new ordinance prohibits frame buildings in that part of the city. If some eastern manufacturer would offer metal structures which come within the meaning of the ordinance, be as proof against fire as brick, and to be constructed at a reasonable cost, the deserted sections of the city would soon be built, and each house occupied as soon as completed. The owners of property are most eager to improve in order to earn revenue, and the people are anxious to return to their former homes, within short distances of their places of business and employment. There is more land idle in the heart of the city today than enough to build a good-size city.

The Colburn Machine Tool Co., Franklin, Pa., builder of vertical boring and turning mills, announces that after Sept. 1 it will be represented in the Chicago territory by the E. L. Essley Machinery Co., of 62 W. Washington street. Charles M. Robertson, formerly superintendent of the plant of the Colburn Machine Tool Co., will be associated with the Essley company as special representative and expert. Mr. Robertson has had a large and varied experience in the manufacturing and selling of vertical boring mills. A representative line of boring mills will be carried in stock in Chicago and machines will be shown at the store belted up and running. The Colburn company has recently brought out an entire new line of vertical boring mills which are known as their "New Model" type.

State Auditor Iverson of Minnesota estimates that there is an average of 1,000,000 tons of iron ore on each of the 1,000 40-acre tracts owned by the state and leased to operators. Within 50 years he figures that the state will have accumulated from the income on these lands $131,000,000 in its public school fund and $30,000,000 in the university fund. The state has unexplored land upon which to base an expectation of more iron ore.

The first steel street cars have begun running in Chicago. They look like the wooden cars and are about 500 pounds lighter.

MINES ARE BUSY.

Work Resumed on Bonnie Property—Newport Mine Rushed.

Republic, Mich., Aug. 23.—Mining is being resumed at the Bonnie property, at Ironwood, Gogebic range. The Bonnie is owned by Ferdinand Schlesinger, of Milwaukee, and is adjacent to that same operator's big Newport mine, one of the greatest underground producers in the Lake Superior iron region. The Bonnie has been practically closed down for a number of months. The working force of 50 men is now being increased to 300. At the Newport, mining operations are being rushed, and it is likely that the property will ship even more ore than was forwarded last season, when with an output of nearly 600,000 tons the mine led all other Gogebic range producers. The Newport is employing 1,300 men.

Oglebay, Norton & Co.'s Montreal Mining Co., which is operating the Ottawa property, in the Wisconsin portion of the Gogebic, has further added to its holdings in that vicinity by taking over an adjoining tract of 40 acres. The same operator's Buckeye mine, near Commonwealth, Wis., on the Menominee range, is now making daily shipments for the first time since the work of development was undertaken several years ago. It is the intention to produce at least 50,000 tons this season. Oglebay, Norton & Co.'s Bristol property, at the western end of the Menominee, is making heavier shipments than any of the other mines of the Crystal Falls district. Already two-thirds of the big stockpile has been forwarded, and the daily output is being maintained at practically the maximum rate.

Corrigan, McKinney & Co.'s Tobin mine at Crystal Falls, which it was thought would be compelled to carry over all of its stockpile of 150,000 tons, will make a considerable shipment this season, after all. At least half of the stockpile will be sent out. Some of this ore was mined two years ago. A new shipper in the Iron River-Stambaugh district is Corrigan, McKinney & Co.'s Baker property. A notable improvement in this field will be the erection of a steel shaft house at the Steel Corporation's Dober mine.

Temporarily suspending exploratory work on the new Cuyuna range, the mining department of the Jones & Laughlin Steel Co., of Pittsburg, is transferring its operations of that nature to the Menominee. Properties in the Iron River district have been taken under option and will be given a thorough test. Two diamond drills will be operated. Exploratory work on the Cuyuna will be resumed the coming winter. Pickands, Mather & Co. are making good headway with the exploration of the Barras property, near Stambaugh. The shaft is down 300 feet and drifting is in progress. The Cleveland-Cliffs Iron Co. is exploring the Youngs-Coe tract, southwest of the Hiawatha mine. The company also has two diamond drills operating in the vicinity of the Stambaugh railroad station. The Florence Iron Co. has taken a lease on the Bates property, in section 19, 43-34, to the north of Iron river. It has been exploring the tract with a diamond drill for a number of months.

The Florence Iron Co.'s Florence mine, at Florence, Wis., Menominee range, will produce more ore this season than in any single year to date in its history. Its shipments will foot up approximately 250,000 tons. The Florence is employing 300 men, so that the production of 250,000 tons indicates a low mining cost for an underground producer.

The old Conrad mine, a western Marquette range property which was operated in a modest way many years ago, is finally to be thoroughly and systematically tested. Along with the Hurkins tract, adjoining on the south and east, it has been taken under option by George J. Maas, mining man and capitalist, of Negaunee.

The Vermilion Steel & Iron Co. is reported to have struck a large deposit of Bessemer ore on the Vermilion range on property known as the Sheridan homestead. A diamond drill reached ore at 196 feet and was still in ore at 500 feet. A second hole was started 1,000 feet distant from the first and ore was found 30 feet from the surface.

EASTERN PENNSYLVANIA NEWS NOTES.

The Lebanon Valley Iron Works, Lebanon, Pa., will place its new 16-inch merchant bar mill in operation about Sept. 15. This mill will increase the company's capacity about 50 per cent.

The Penn Iron Co., Ltd., Lancaster, Pa., which has been idle since last November, expects to resume operations manufacturing bar iron, spikes and bolts in about a month.

The Wiener Machine Works Co., Lebanon, Pa., is at work repairing five furnaces of the Lackawanna Steel Co., which are being partially rebuilt. This company is also at work on a duplicate order for an 84 by 60 inch Corliss blowing engine for the Jackson Iron & Steel Co., as well as making two patented blowing heads for the Woodstock Iron Co., of Alabama. Three new cinder cars are being built for Worth Bros., Coatesville, and the furnace is being rebuilt and blowing engine repaired for the Sheffield Coal & Iron Co., Sheffield, Ala. Some general repair work is also being done for the Pennsylvania Steel Co.

No. 1 Lebanon furnace of the Pennsylvania Steel Co. will be ready to blow in about Sept. 1. This stack has been entirely relined, a new dust catcher installed and the downcomer changed.

The Susquehanna Iron Co., Columbia, Pa., is in full operation at all its plants for the first time since the present management took charge, over two years ago. The company manufactures wrought iron pipe and refined bar iron.

The Jansen Iron & Steel Co., bar iron manufacturer, is operating full time.

The Lebanon Steel Casting Co., Lebanon, Pa., has just received a large order for automobile engine castings.

The blast furnace of the Berkshire Iron Works is about ready to go into blast.

Iron Making In China.—Theodore D. Morgan, Sharon, Pa., formerly vice president and general manager of the Atlanta Steel & Tin Plate Co., has just returned from a trip around the world during which he spent two months in China where he investigated that country's iron industry. He visited the Hanyang Iron Works, 600 miles up the Yangtse Kiang river, but still within reach of ocean liners, where he found about 20,000 employes at work in a plant possessing extensive equipment. Two blast furnaces were at work and two more building; six basic open-hearth furnaces of 30 tons capacity each are operated and two Bessemer converters are being installed. Mr. Morgan found a rail mill capable of rolling 250 tons of 85-pound rails a day and a new mill under construction which will turn out 750 tons a day. Able bodied men doing common labor are paid six cents a day, and women get five cents. Open-hearth steel melters, rollers, heaters and other skilled men run from $4 to $6 a month.

The Sharpsville Furnace Co. blew in its Sharpsville, Pa., stack July 1. Through a typographical error, the statement was made Aug. 19 that the Sharpsville stack had been blown out on the date mentioned.

HIGHER PRICES.

Expected as Result of Lowering Tariff on Old Material.

Toronto, Can., Aug. 23.—The effect of the reduction of the American duty on iron and steel scrap from $4 to $1 per ton, will probably be to advance the price and steady the market, rather than increase exportation to the United States to considerable extent. It must be borne in mind that there is a large and expanding market in Canada for scrap, and that latterly the Canadian imports have considerably exceeded the exports. The Canadian trade and navigation reports for the three months ending June 30 last show that while the exports of wrought iron and steel scrap were 4,365 tons, of which 3,992 went to American markets, the imports under the same head aggregated 8,887 tons, of which 3,758 came from the United States. For the fiscal year ending with March, 1909, the figures were: Total exports, 6,919 tons; to United States, 6,681 tons; total imports, 11,022 tons; from United States, 8,029 tons. During the fiscal year 1907-8, the exports were 23,141 tons, of which 22,930 were shipped to the United States; while the imports totalled 32,825 tons, of which 11,151 tons came from the American market. The above figures do not include cast iron scrap, which does not appear on the list of exports, though it was imported to the amount of 41,554 tons during the last two fiscal years.

The effect of the American tariff was discounted in advance by the manufacturers, who for some weeks previous to its adoption have been buying heavily and laying in large stocks in anticipation of an increase in price. This movement naturally resulted in stiffening prices and later contracts have been made at somewhat advanced rates. Dealers in scrap are now paying $1 per ton more in anticipation of a general and permanent advance, but matters are at present in a transition stage and no arrangement as to a settled price under the new conditions has been arrived at among dealers. It is claimed that the old United States tariff gave the Canadian mills an opportunity of buying scrap for from $2 to $3 per ton less than they would have had to pay with the open American market, and placed the Canadian scrap dealer at a disadvantage, as, when the market in the United States was dull, large quantities of American scrap were dumped in Canada, while the high tariff prevented accumulations here from finding an outlet in the United States and kept prices depressed. The wider market now offered by the mills of Buffalo, Cleveland and Pittsburg in competition with Canadian plants is regarded as certain to increase prices and may to some extent increase exports across the border.

BUREAU OF STANDARDS

Will Assist Manufacturers in Perfecting Steel Rates.

Washington, D. C., Aug. 23.—The bureau of standards of the United States government has been invited to aid in a work instituted by the railway companies and the manufacturers of steel rails, whereby it is expected that better results may be achieved in rail making, and that in the future rails for American railroads shall be more durable and less subject to defects and flaws which render them dangerous and less lasting.

In speaking of the results of a conference held here during the past week, at which the aid of the officials of the bureau of standards was invited for the work in view, Dr. Stratton, chief of the bureau, said:

"The proposed experiments are in no way under government supervision, but are under the control of the railway companies and manufacturers of steel rails. The experiments are to be made by these people, and the part which the bureau will have in the experimentation and investigation will be confined to such scientific assistance as we shall be able to give. The rails will be furnished by the manufacturers and they will be tested by the railway companies. The sole object is to secure the best possible rails."

These investigations and experiments are to be conducted indirectly under the supervision of the officials of the commerce department. It is known that the aid of the experts of the government has been sought by the manufacturers and the railway companies to the end that the best possible results may be secured, and that the advice and assistance of the scientific experts of the government may be had in connection with the experiments. The subject has been brought to the attention of the board representing the Interstate Commerce Commission for investigating the block signal service with a view to recommending to congress for its information everything that can be collected regarding ways and means for safeguarding railway travel. As has been pointed out upon another occasion, the government has nothing to do with these investigations and experiments except to give all possible assistance to the railway operators and the rail manufacturers in perfecting the tests of rails. It has been found upon investigation of the subject that too often rails have been found to be weak in spots, or subjected too easily to wear when under high strain on lines of heavy traffic. It is desired by the manufacturers, as well as by the roads purchasing the rails, that improvements in rail making shall be made.

It is claimed here that the initiative in the movement for securing the aid of government scientists in the experimentation with steel rails was taken by the American Railway Engineering and Maintenance of Way Association, a committee of which came here and consulted with the commerce department officials and with the chief of the bureau of standards. Tests will be made to secure a dependable rail in the interests of the railways and the traveling public.

PETITION FOR READJUSTMENT OF COKE RATES.

Washington, D. C., Aug. 23.—A petition has been filed with the interstate commerce commission involving questions at issue regarding coke rates from the Pocahontas district to Ironton and Columbus, Ohio. The claim is made in the petition, which is filed by pig iron producers in Wellston and Jackson, Ohio, that the rates in queston give the producers in Columbus and Ironton an advantage over those in the district from which the petition emanates.

The claim for an adjustment of these rates on coke is filed with the commission by the Jackson Iron & Steel Co,. the Star Furnace Co. and the Globe Iron Co., of Jackson, and the Wellston Steel Iron Co., of Wellston, and the railroads involved are the Norfolk & Western, the Baltimore & Ohio and the Cincinnati, Hamilton & Dayton.

One of the allegations made in the complaint is that the advance in rates on coke which has been made since 1902, is in violation of the Sherman anti-trust law, because of being the result of an agreement between the Pennsylvania, the Norfolk & Western, the Baltimore & Ohio and the Chesapeake & Ohio roads, and the purchase by the Pennsylvania road of large holdings of stock in the other companies.

Architects are preparing plans for a five-story addition to Minnesota Moline Plow Works, Minneapolis. It is to be 80 x 100 feet and will cost $70,000.

The Champion Machinery Co., Joliet, Ill., is preparing to erect a two-story addition to its plant. The new building will be 66 x 150.

Stock Prices Fall Rapidly

Last week's trading in stocks was characterized by an organized attack upon the market by the bull element. Stocks declined rapidly during the early part of the week and continued the downward movement until nearly the close, when there was a partial recovery. Monday, stocks declined sharply, with sales numbering 1,137,808. The reaction was particularly severe in Union Pacific issues. United States Steel closed with a loss of 1⅞ for the day. On the Chicago market, Pneumatic Tool rose to 30, and in Pittsburg, Harbison-Walker Refractories, common and preferred, made new high records. Tuesday was marked by heaviness in Union Pacific, and a generally unsettled list, which recovered rather sharply in the afternoon. The total transactions were over a million shares, of which United States Steel and Union Pacific and Reading supplied more than one-third. Republic Iron & Steel suffered a large loss. After a strong opening Wednesday, the market sagged on unfavorable reports regarding E. H. Harriman's health. Another million-share market resulted in the day's trading, in which 131,000 shares were United States Steel. An engagement of $1,250,000 in gold for Argentina was announced, and also arrangements for the shipment of $3,000,000 to Japan next month. Thursday, there was another violent break in prices, drops of from 4 to 10 points being recorded. Union Pacific lost 2½, making a net loss of over 10 points from the beginning of the week. Chicago Pneumatic Tool moved up to 33 in Chicago during the day. The bear raid continued Friday, Union Pacific falling to 204, and New York Central and Reading also broke sharply. Supporting orders made their appearance later in the day, and there was a general rally throughout the list. Saturday followed up the closing gains Friday afternoon, and several stocks advanced as much as 2 points, while fractional gains were the rule. Money on call closed nominally at 2¼. The range during the week was from 2½ to 2, with the lower rate prevailing more generally. Time money eased off and rates lowered. Exports of gold from New York for the week were $1,250,000 to Argentina. Imports at New York were $94,533. The excess of gold exports over imports for the fiscal year ending July 2 was $57,090,000, which was greater than for any similar period since 1904. This was largely overbalanced by the large home production. Bank clearings in the United States were estimated for the week at $3,256,090,003, against $3,093,044,025 the week before, and $2,346,664,012 the corresponding week last year. The actual report of clearing house banks showed surplus decreased $3,154,075; loans decreased $6,168,200; deposits decreased $2,504,600, and the ratio of reserve 26.4, against 26.6 the week before. Trust companies and non-member banks showed loans and investments increased $11,815,400; total deposits decreased $3,507,400, and the percentage of reserve was 18.1, against 18.5 the week before. Failures for the week numbered 182, against 225 last week, and 239 the corresponding week last year. Liabilities in commercial failures for August were $4,563,293, against $15,140,862 for the same period last year. The number of immigrants for the week fell to 12,334, a decline of 2,000. The number of shares traded in during the week was 6,175,150, against 6,841,000 the week before, and 4,629,900 the corresponding week last year. The value of bonds, exclusive of government bonds, sold was $25,515,000, against $21,674,000 the week before, and $12,238,000 the corresponding week last year.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. Aug. 21	Changes in week	Date 1909 Ann. M't'g.	Stock Outstanding	Dividend Basis	Dividend Last Declared	Dividend Date Last Div. Pay.
Allis-Chalmers	15⅝	+ ⅛	Sept. 2	$19,820,000		.....	.....
Allis-Chalmers, pr	36⅞	+⅞		16,150,000	7 cum	1¾ Q.	Feb., 1904
American Can	13	— ⅛	Feb. 2	41,233,300		.....	.....
American Can, pr	63½	.....		41,233 300	7 cum	1¼ Q.	July, 1909
Am. Car & Foundry	67⅞	+ ⅛	June 24	30,000,000		½ Q.	July, 1909
Am. Car & Fdy., pr	119	—2¾		30,000,000	7 n. c.	1¾ Q.	July, 1909
American Loc	62¾	—3⅛	Oct. 19	25,000,000	5	1¼ Q.	Aug., 1908
American Loc, pr	117	—3		25,000.000	7 cum	1¾ Q.	July, 1909
American Ship	67	.....	Oct. 13	7,600,000	4	1 Q.	Sept., 1909
American Ship, pr	106½	.....		7,900,000	7 cum	1¾ Q.	Oct., 1908
Am. Steel Foundries(new)	39¾	+ ¼	Dec. 2	17,184,000		.....	.....
Barney & Smith	35	.....	June 1	2,000,000	4	1 Q.	Sept., 1907
Barney & Smith, pr	85	.....		2,500,000	8 cum	2 Q.	June, 1908
Bethlehem Steel	33	+1	April 6	14,862,000		.....	.....
Bethlehem Steel, pr	63⅜	— ⅜		14,908 000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	43⅜	—1⅜	March 16	45,000,000*	3	1½ S. A.	Aug., 1909
Cambria Iron	46½	.....		8,468,000*	4	2 S. A.	Sept., 1908
Chicago Pneumatic Tool	31¾	+3¾	Feb. 15	6,145,800	4	1 Q.	Oct., 1907
Colorado Fuel	45	—1	Oct. 18	34,235,500		3½	April, 1902
Crucible Steel	12¾	+ ¼	Oct. 20	24,578,400		.....	.....
Crucible Steel, pr	79	+ ¼		24,436,000	7 cum	1 Q.	Mar., 1909
Empire Steel	10	.....	April 27	1,254,770		.....	.....
Empire Steel, pr	65	.....		2,500,000	6 cum	3 S. A.	July, 1909
Fay & Egan	90	.....	Feb. 18	1,000,000	7	1¾ Q.	Nov., 1908
Fay & Egan, pr	110	.....		1,000,000	7 cum	1½ Q.	Aug., 1909
General Electric	168½	—1¼	May 11	65,178,800	8	2 Q.	July, 1909
Harbison-Walker	32	+5	Jan. 18	18,000,000		½	Oct., 1907
Harbison-Walker, pr	95	.....		9,690,000	6 cum	1½ Q.	April, 1909
International Pump	42¼	+ ⅜	June 8	17,762,500		1	April, 1905
International Pump, pr	88⅛	— ½		11,350,000	6 cum	1½ Q.	Aug., 1909
Lackawanna Steel	49¾	+ ¾	March 10	34,971,400		.....	.....
Lake Sup. Corp	27¼	+1⅜	Oct. 6	40,000,000		.....	.....
New York Air Brake	90	—5⅞	June 17	8,012,500	8	2 Q.	Oct., 1907
Niles-Bement-Pond	100	.....	Feb. 3	8,500,000	3	1½ Q.	Sept., 1909
Niles-Bement-Pond, pr	100	.....		2,000,000	6 cum	1½ Q.	Aug., 1909
Otis Elevator Co	60	.....	March 15	6,375,300		1½ S. A.	Oct., 1909
Otis Elevator Co., pr	100	—1		6,295,000	3 n. c.	1½ Q.	July, 1909
Pa. Steel	68	.....	May 10	10,750,000		.....	.....
Pa. Steel pr	117	+ ½		16,500,000	7 n. c.	3½ S. A.	May, 1909
Pittsburg Coal Co	22¾	+7⅞	March 9	28,104,600		.....	.....
Pittsburg Coal Co., pr	61½	+7		27,071,800	7 n. c.	1¾	April, 1905
Pressed Steel Car	50⅞	+ ⅝	Feb. 17	12,500,000		3	Aug., 1904
Pressed Steel Car, pr	107	—2		12,500,000	7 n. c.	1¾ Q.	Aug., 1909
Pullman	197	.....	Nov. 10	100,000,000	8	2 Q.	Aug., 1909
Railway Stl. Spring	50¼	+ ¾	March 4	13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring pr	107½	+1¼		13,500,000	7 cum	1¾ Q.	July, 1909
Rep. Iron & Steel	38	—1½	Oct. 20	27,191,000		.....	.....
Rep. Iron & Steel, pr	106	—1¾		20,416,900	7 cum	2 Q.†	Aug., 1909
Sloss-Sheffield	85¼	— ⅝	March 10	10,000,000	5	1¼ Q.	Sept., 1909
Sloss-Sheffield, pr	119	.....		6,700,000	7 n. c.	1¾ Q.	July, 1909
U. S. Pipe & Fdy	32½	—1⅞	June 23	12,500,000	2	½ Q.	Dec., 1907
U. S. Pipe & Fdy. pr	85¾	+1¼		12,500,000	7 n. c.	1¾ Q.	Sept., 1908
U. S. Steel	76⅜	—2¼	April 19	508,302,500	3 n. c.	¾ Q.	Sept., 1909
U. S. Steel, pr	125	—2		360.281,100	7 cum	1¾ Q.	Aug., 1909
U. S. Steel, 5s	114⅝	.....		463,798,000	5	5 A.	.....
Va. Iron, Coal & Coke	65½	—1½	Sept. 21	9,073,680		.....	.....
Westinghouse Elec	86¼	— ¾	June 16	27,173,200	10	2½ Q.	Oct., 1907
Westinghouse Air Brake	117	—1	Oct. 5	14,000,000*		2½ Q.	Aug., 1909

Par value of shares, $100, except those starred (*). $50.
†¼ ex. and 6¼ to apply on deferred dividends.

Copper Stocks.

New York.—Amalgamated Copper closed at 87½, a loss of 1 point.

Boston.—Butte Coalition closed at 25½, a loss of ½. Calumet & Arizona closed 105, a loss of 4; Calumet & Hecla closed 675, a loss of 19 points; North Butte closed at 58¾, a loss of ⅜; Quincy Mining closed at 93, a loss of ½.

AMONG MACHINERY MAKERS.

BUFFALO.

Improvement in General Machinery—Some Large Contracts Awarded.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, Aug. 24.

A healthy improvement has taken place in the general machinery market, of which the automobile industry is an important factor here at the present time. The Pierce-Arrow Motor Car Co., one of the leading automobile interests in New York state, officially confirms the report that its entire output for the remainder of this year and the first six months of 1910, thus including all 1910 cars, has been sold. The company also authorizes the statement that orders booked aggregate between 1,500 and 2,000 cars. Most of the new mechanical equipment essential to the 1910 output has been installed. Two new buildings are now under construction, the new machine and body buildings each being supplemented by a new structure.

Plans are being made for the electrification of the West Shore railroad between Syracuse and Rochester, N. Y.; also the Pennsylvania division of the New York Central between Lyons and Geneva, N. Y. This necessitates the purchase of considerable power and railroad equipment. These interests are controlled by the New York Central lines, which also own the Rochester and Eastern Rapid Railway Co., from Rochester to Geneva.

D. C. McMonagle, president and general manager of the Walkill Transit Co. announces that the company is in the market for three closed cars of the double-truck type. The company has planned track extensions in the vicinity of Middletown, N. Y. A concrete bar barn, 50 x 200 feet, is now building and a gravity coal trestle has just been completed.

It is reported here that the General Electric Co., of Schenectady, N. Y., has begun the manufacture of a new line of direct-current generators known as form S, which are said to be especially adapted to the generation of current for electric railways. The new generators embody a number of improvements that are the outcome of a long series of experiments in the design and construction of direct-current machinery. The new machines are built to cover a large range of power, from 100 kilowatts to 2,700 kilowatts, and in a large variety of sizes. The machines were designed primarily for direct connection to steam engines and are built to run at continuous speed.

The Buffalo, Lockport & Rochester Railway Co., of Buffalo, N. Y., has received from the Baldwin Locomotive Works 12 electric trucks. They are standard gage and designed for a maximum center pin load of 25,000 pounds. Each truck is equipped with two General Electric No. 207-A motors, wheel base 6 feet 6 inches and wheels forged and of hard steel, 36 inches in diameter.

The Buffalo & Southern Railway Co. is preparing plans for the extension of its line to the Allegheny valley, which will make a market for steel rails to cover a distance of about 10 miles, also for additional power and rolling stock equipment.

The Halcomb Steel Co., of Syracuse, N. Y., is erecting a rolling mill to supplement its present facilities. This will double the rolling mill capacity of the plant and take care of the increased demand upon the company for rolled and tool steel.

A new water works system will be installed at Mount Morris, N. Y., at a cost of $40,500. The board of trustees has awarded the general contract to J. C. Swanson & Son, Jamestown, N. Y. His bid was the amount named.

The New York state superintendent of public works has let a contract for barge canal work in the Mohawk river district to the American Pipe & Construction Co., 112 North Broad street, Philadelphia, which concern will receive $2,661,040.40 for the work. This is one of the most important contracts in connection with the proposed 1,000-ton barge canal, which is the enlarging of the old Erie canal, running the length of New York state. A large amount of hoisting and excavating machinery will be needed. Scott Bros., Baldwinsville, N. Y., were also given contract by the state. The job will be known as contract No. 53. Scott Bros.' bid was $116,735. Most of the contract is for work on the canal near Phoenix, N. Y.

MILWAUKEE.

New Lines Added by Some Wisconsin Machinery Concerns.

Milwaukee, Aug. 24.—The machinery trade is looking forward to the winter and 1910 with much hope, and although it is a fact that conditions are not yet as good as before the panic, the improvement has made the manufacturers highly optimistic. Most plants are not yet running with full forces, although all are running full time and many at over-time. Men are being added gradually, in keeping with the increase in orders, which has been steady and firm. August will be a record month for 1909.

The outlook seems bright enough to encourage several firms to branch out in new lines. An instance of this is the Chain Belt Co. which began the manufacture of concrete mixing machinery some time ago and has already built up a large trade.

The Northwestern Malleable Iron Co., one of the largest malleable concerns in the country, is typical of the condition in that field. Frederick W. Sivyer, president, reports that the business for August is far above July or any previous month since the time the panic can be said to have officially ended. The plant is running at 80 per cent of working force, but all men are on full time with excellent prospects of reaching full capacity soon.

The Eclipse works of the Fairbanks-Morse Co., at Beloit, will have a fine system of trackage when the improvements now being made by the Milwaukee road are completed. The main object of the changes is to give the company more room for its new buildings.

The Frank L. Wells Co., of Kenosha, Wis., has instituted a profit-sharing plan for employes. The 16 oldest employes are entitled to the dividend. Mr. Wells sets aside 6 per cent of the earnings for himself, dividing the remainder with the employes.

Property owners at Ives, near Racine, Wis., are planning to organize an advancement association and offer building sites for manufacturing plants at low cost.

The National Society for the Promotion of Industrial Education will meet in Milwaukee in November. Prof. James C. Monaghan, secretary of the association, and formerly of Washington, will become professor of the commercial college of Marquette university, Milwaukee. F. W. Sivyer, president of the Northwestern Malleable Iron Co., Milwaukee, is a director of the association.

The J. E. Radcliffe Mfg. Co., Milwaukee, will build another story to its main building next fall.

The Fuller & Johnson Co., of Mad-

ison, Wis., has accepted plans for a new office building on the lines of the handsome administration building of the Gisholt Machine works of that city. The Fuller & Johnson Co.'s specialty, a $70 farm gasoline engine, is meeting with a large demand.

CLEVELAND.

Machinery Makers Keep Busy—Indications Point Toward Better Prices in Near Future.

Office of THE IRON TRADE REVIEW, Browning Building, Aug. 24.

Local manufacturers are unanimous in the feeling that this month closes one of the most remarkable summers that they have ever experienced. Following close upon the heels of an industrial depression that affected practically all lines of business, a summer bringing with it normal conditions—an unsteady demand and a vacation slump—was more than was hoped for during the spring months. Instead the summer months have brought a steady demand in most lines that precluded any possibility of the usual let-up. Of course, prices have not yet reached the level of two years ago, but all signs point to a general recovery in the near future. A scarcity of raw material, with a resulting increase in pig iron quotations, which is far from being improbable, will restore prices to the old level.

All lines appear to be filling up on their capacities, and shops and foundries have enough on hand to keep them busy for some time to come. Heavy machine tools are moving more briskly and the return of the railroads to the ranks of buyers holds promise for dealers in railroad specialties.

The C. O. Bartlett & Snow Co., Cleveland, advises that its business so far this year shows an increase of about 50 per cent over that of last year. This concern has installed several new machine tools in its shop during the past month, and is now putting in one special new lathe and one milling machine. The company is about to manufacture a line of vacuum dryers, in addition to the steam, direct and indirect heat dryers it now makes. Notable among recent orders received by this firm is one for a Greene self-dumping car haul, with a capacity of two cars per minute, to be installed at the Burnside colliery of the Philadelphia & Reading Coal & Iron Co., Pottsville, Pa.

The Brown Hoisting Machinery Co., Cleveland, reports that its business during this month was not quite so good as that of July. This company is now rebuilding the plant of the Stewart Iron Co., Sharon, Pa.

Among recent orders received by the Ohio Blower Co., Cleveland, are one for a large oil separator for a concern in Japan; several large contracts from leading automobile interests, and two orders for heating apparatus. This company advises that its shipments for the first seven months of the present fiscal year exceed those of the corresponding period of 1908 by about 30 per cent, and that its working force has been increased 20 per cent during the past eight weeks. The concern has recently installed considerable new equipment and will soon be in the market for more, as negotiations are under way for larger shop space.

The J. D. Smith Foundry Supply Co., Cleveland, reports that inquiries for equipment are very numerous. Contracts have just been completed for the U. S Aluminum Co., New Kensington, Pa.; the Buick Motor Co., Flint, Mich.; the Allyne Brass Foundry Co.; the Peerless Motor Car Co; the Standard Brass Foundry Co., and the National Bronze & Aluminum Foundry Co., all of Cleveland. Core ovens for the Pennsylvania Steel Co., Steelton, Pa., are being completed, and work has been started on ovens for the Falk Co., Milwaukee, the M. L. Oberdorfer Brass Co., and the Toledo Motor Car Co., both of Toledo, and the U. S. McAdamite Metal Co., Brooklyn.

Corrigan, McKinney & Co., Cleveland, will erect several new buildings at their blast furnace plant on the Cuyahoga river. The buildings will be of brick and reinforced concrete construction, and will comprise a pumphouse, powerhouse, an engine room and a machine shop. The contracts for the buildings have been awarded to the Hunkin Bros. Construction Co., Cleveland.

The Cleveland Machine & Mfg. Co., Cleveland, will enlarge its plant on Hamilton avenue. The new building will be two stories high and will be of brick and steel construction.

NEW YORK.

Fair Volume of Small Orders for Machine Tools.

Office of THE IRON TRADE REVIEW, Room 1005, No. 90 West St., Aug. 24.

In the absence of important developments, the local machine tool trade is running along quietly, enjoying a very fair volume of small orders, but feeling to some extent the effect of the holiday season. Those houses which have branches over the country and hence are able to judge conditions from a wider than local viewpoint state that New England and the immediate New York district are least active, and the experience of purely local selling interests seems to bear this statement out. The automobile manufacturing industry is still the most productive of business, keeping up a steady demand for milling machines, gear cutters, larger turret lathes, certain classes of grinders and a few other lines in particular. Prices on high power millers are up 10 per cent and deliveries are rather remote. The fact that, with one or two exceptions, no large railroad requirements are likely to be placed during the current month will render it considerably smaller, in point of total bookings, than July.

A good scattering of small railroad orders is reported, these coming from a large number of roads. It is probable that the American Locomotive Co. will close within a few days on its inquiry for a total of 39 cranes, which range up to 120 tons. The understanding is that this order will not be distributed, but will go to one maker; it will aggregate in the neighborhood of $250,000. Next to the purchase for the Gary plant, this is probably the largest crane order ever placed.

As announced in late dispatches in last week's edition, manufacturers of nuts and bolts have made general advances. Bolt prices have been increased another 7½ per cent, making a total of 10 per cent within the month. The discounts on both hot pressed and cold pressed nuts have been reduced 20 cents per 100 pounds, equivalent to an advance of $4 per ton.

The extensive plant of the Goldschmidt Detinning Co., Chrome, N. J., is making rapid progress toward completion. It is announced by Dr. Franz Hirschland, vice president and general manager, with offices at 60 Wall street, that the plant will probably be ready for operation within the next two or three months. The main building is 50 x 300 feet and several smaller buildings are under construction.

The Crocker-Wheeler Co., Ampere, N. J., announces that about Sept. 10 it will open an office in the Ford building, Detroit, with Charles W. Cross in charge of the branch.

The Eberhard Faber Pencil Co., 39 Greenpoint avenue, Brooklyn, is making some important improvements on its power plant. These include the installation of two Parker boilers, each of 300 horsepower, to replace old equipment.

The Youngstown Car Mfg. Co., through its New York office, has sold a lot of 53 all-steel mine cars for shipment to Honduras and a similar lot of 12 for delivery on the west coast of

South America. Inquiry for export is reported as brisk.

In connection with the coming census, the Sloan & Chase Mfg. Co., Newark, N. J., has awarded contracts for special machines aggregating $125,000 in value. The contracts call for 100 tabulating machines at $478 each and 300 perforating machines at $250 each. This company notes a steady improvement in business, principally in special work.

C. B. Nicholson & Co., 90 West street, report two recent steel chimney contracts, one calling for a stack 60 inches x 154 feet for the E. Faber Pencil Co., Brooklyn, and another for a 48-inch stack 107 feet high for the Westchester Lighting Co., Pelham, N. Y. This company is also putting in the coal hoppers and chutes for the power plant of the new Chelsea piers on North river.

PITTSBURG.

Manufacturers Not Worried by Temporary Lull in Orders.

Office of THE IRON TRADE REVIEW,
510 Park Building, Aug. 24.

Somewhat of a lull has fallen upon the machinery market, as the work upon which heavy equipment builders have been estimating is now largely under contract. The new inquiry is not heavy, which is scarcely more than may be expected since the buying movement to cover the needs of increased capacities and improvements has been very active and of large proportions during the past several months. The manufacturers at present have their shops in pretty fair shape and are not much concerned with the temporary quietness in new work that has come upon the market.

Complaint is to be heard upon the low prices at which some builders have seen fit to accept work. In the main, however, the price situation is stronger, for while it is appreciated it was within the province of good management to undertake aggressive policies to maintain plant organizations during the time of depression, this condition is no longer present. The roll makers continue to book a very satisfactory volume of business and some of the prominent works in this district are maintaining their operations at double turn.

It is expected that the inquiries for the new steel works and slabbing mill of the Standard Steel Car Co., at Butler, Pa., will shortly be in the hands of machinery makers, probably within the next week. This is the most important project in this district now commanding the interest of the trade.

A recent important order for cranes closed in this territory has been that for the nine machines for the open-hearth department of the new works of the Jones & Laughlin Steel Co. at Aliquippa, Pa. The assortment included four ladle and five standard cranes and the capacities ranged from 25 to 120 tons. Five of the machines will be furnished by the Morgan Engineering Co., Alliance, O., and four by the Alliance Machine Co., Alliance, O.

The Motch & Merryweather Machinery Co., Cleveland, is now established in this territory with an office at 1124 Farmers' Bank building, in charge of James M. Herron as manager. The company is handling the Bullock line of machine tools.

The inquiry for large engines for mill duty, which has been quite active in this territory, is less brisk at the present time, as most of the orders which were in connection with additional plant construction have been placed. The Jones & Laughlin Steel Co., is, however, still negotiating for the power units for driving its new sheet bar and billet mills at its Aliquippa works. These mills will be of the continuous type and will be furnished by the Morgan Construction Co., Worcester, Mass.

Crane builders are giving close attention to the large inquiry which the American Locomotive Co. has had before the trade for the past month. The 38 to 40 machines called for represent the new requirements in bulk of the company's various locomotive shops about the country. The order will entail an expenditure of about $200,000.

The Carnegie Steel Co. has recently been awarding equipment contracts for requirements in connection with the building of a new 22-inch structural mill at the Clairton plant. This mill was authorized at about the beginning of the business depression, but little work had been done upon it until recently. The improvement will now be pushed to completion.

NEW FREIGHT RATES TO THE PACIFIC COAST ON STEEL PRODUCTS.

Effective Sept. 10, the Trans-Continental Freight Bureau has announced a carload rate of $13.70 per gross ton on steel rails fram Johnstown, Pa., and Cumberland, Md., to Pacific Coast terminals. The old rate between these points was $14.00. The same tariff supplement quotes a new special commodity rate of $13.10 per gross ton on rails from South Lorain, Ohio, to Pacific coast terminals.

Effective Sept. 20, car wheels and axles, when shipped in straight carloads, will be given a rate of 77 cents per hundred pounds from Butler, Homestead, McKee's Rocks, Munhall and Pittsburg, to the Pacific coast. The old tariff requires the local rate between these points and Chicago or St. Louis plus the 65-cent commodity rate regularly charged on car wheels between St. Louis or Chicago and the Pacific coast.

SHEFFIELD'S MONOPOLY

In High Speed Steel May Be Broken by the Payne Tariff Law.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, England, Aug. 13.

The Sheffield steel industry has been affected during the past week by two foreign conditions. The labor troubles in Sweden have tied up the supply of the best qualities of iron which are essential to certain classes of steel such as armor plates, and form part of the raw materials used in the staple industries of crucible steel. The other condition, of course, is the new American tariff. It is too early yet to gage the effect on the steel trade, but fears are expressed that Sheffield's monopoly in high-speed steel will be broken. This fear is increased by reports of the activity of American steel manufacturers sheltered by the tariff. Cutlery makers are already feeling the benefit of the tariff question having been settled, pending which a vast amount of business has been locked up. There is a fear, however, that the new tariff may eventually kill the Sheffield trade in razors.

The Midland iron and steel trade is not likely to be affected in any direct way by the new tariff, as nothing has been done at all likely to put the producers here on a competitive basis. Indirectly the market may be stffened, as there is no doubt that the American conditions have materially improved matters in the northern iron and steel districts. It is too soon to estimate in detail the exact effect of the tariff changes even here, but the ending of the protracted period of uncertainty has undoubtedly been one of the causes of the general improvement in trade conditions in these centers during the past week. English demands, however, stimulated by improvement in general trade appear likely to put up prices to such an extent as to distract attention from any possible improvement in exports to America.

MAGNETITE ORE DEPOSITS AT MINEVILLE

Recent Improvements in Mining and Concentrating Methods in the Port Henry District — General Description of the Workings — Heavy Deposits.

By B. S. Stephenson.

The magnetic ore operations in the Port Henry district of upper New York state, which have played a more or less important part in eastern blast furnace and rolling mill activities for considerably over half a century, have recently assumed more extensive proportions and, as the result of vigorous development work and the installation of improved equipment, are now yielding the largest output in their history. This increase in production has followed the breaking down of the old-time prejudice against magnetites, arising chiefly from a misguided effort to reduce them without proper preparation for blast furnace use. Their high original iron content, easily and cheaply raised by improved concentrating methods, taken in connection with the low cost of mining, has made these deposits of untold advantage to eastern furnacemen in giving them a mixture sufficiently cheap to permit the continuation of operations during periods of low iron prices.

These properties are either owned and operated or their output is handled by Witherbee, Sherman & Co., Inc., offices of which are at Port Henry, N. Y., and 2 Rector street, New York city. The mines in this group now have an annual capacity in excess of 1,000,000 tons of high grade ore, and their ores represent a rather wide variety, as concentrating methods are taken advantage of to produce the several grades best adapted for furnace, puddling and open-hearth work. Their richness and freedom from moisture are features of importance in connection with transportation costs, and it is interesting to note that they have been shipped as far west as Pittsburg and Ohio furnaces, while several cargoes of high phosphorus product have been used in German steel works.

Quite recently a number of important improvements have been made in the equipment of the various workings and extensive exploration work has been carried on with a view of more accurately determining the tonnage in sight. It is the purpose of this article to describe briefly the various mines now operated, with particular attention to the extent of their operations and their probable future. In this connection it should be noted that on the Witherbee-Sherman properties one diamond drill is constantly employed on exploration work, and frequently two are in use. One test hole recently drilled reaches a depth of 1,614 feet, which is remarkable when it is considered that the rod was but 1⅛ inch and the core ⅞ inch. Even more remarkable is an uphole extending about 1,000 feet at an angle of ten degrees above horizontal.

The outlook for this district is apparently very favorable. The completion of the 2,000-ton barge canal, connecting Lake Champlain with the Hudson and through the deepened Erie canal with Great Lake points, will result in a sharp reduction in transportation charges and will enable the Port Henry ores to enter more distant iron producing regions. Two furnaces in the Adirondacks which run exclusively on local magnetites were able to operate continuously through the recent depression, and there are those who predict not only additional smelting capacity for this district, but finishing mills as well.

History of the Workings.

Ore mining operations in the Port Henry district date back over a hundred years, the first on record being at the Cheever mine, some two miles north of the village, where some work was done as early as 1804. It is interesting to note that, although this mine was thought to have been exhausted twenty years ago and opera-

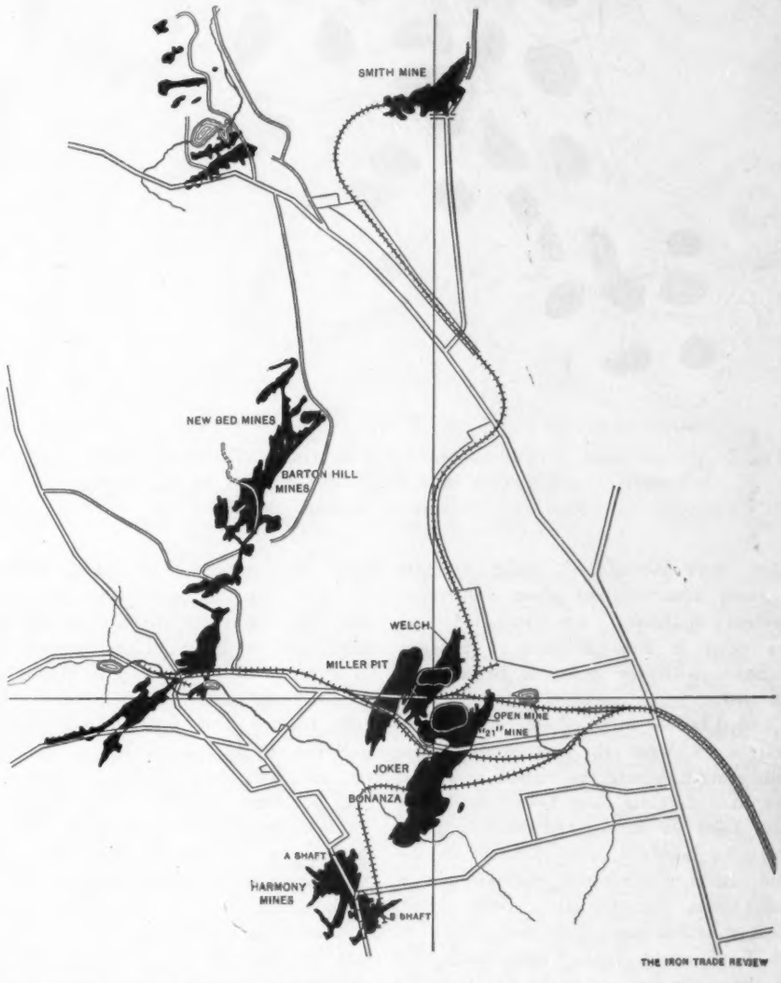


Fig. 1—Map of Principal Mineville Workings, Showing Relative Location.

FIG. 2—UNDERGROUND WORKINGS IN OLD BED MINES. ELLIPTICAL DRIFT RECENTLY DRIVEN AND LOCATION OF ORE POCKET SHOWN IN SOUTHERN PORTION. SUPPORTING PILLARS IN BLACK.

tions were abandoned, quite recently a small concentrating plant and other modern equipment was installed and the mine is now shipping a modern tonnage, with the prospect of a large increase.

The Cheever mine, however, is several miles from the immediate Mineville district, where the richest and most abundant deposits have been found. The first mine to be opened at this point was the Sanford, now known as the Old Bed, which was operated in a small way by various owners until 1849, when it came into the possession of S. H. and J. G. Witherbee, who at the same time acquired the property which has since been known as the New Bed mines. The active working of these deposits began with this date. But two important changes in interests have been made in all that period, one of them in 1862, when the Witherbees acquired the interest of John A. Lee and formed the firm of Witherbee, Sherman & Co., in which a one-third interest was held each by Silas H. and Jonathan G. Witherbee, a quarter interest by George Sherman, and a twelfth by George R. Sherman. The Sherman interest was transferred to the Lackawanna Steel Co. in 1901, but the Witherbee interests have been held intact by the heirs. The firm was inporporated as Witherbee, Sherman & Co., Inc., in 1900.

With the early development of these ore properties, three blast furnaces were built at Port Henry. The Bay State furnaces, which were dismantled many years ago, were located on the shore of Lake Champlain just north of the town, near the site of the present power house of Witherbee, Sherman & Co., and the old foundry building, operated in connection with these furnaces, is still standing. The Cedar Point furnace, built in 1872-3, is now leased by Witherbee, Sherman & Co., to the Northern Iron Co., and is in steady operation, using over 90 per cent of magnetic concentrates in its burden and casting an average of 5,500 tons per month from a stack slightly over 69 feet in height, with a 10-foot hearth, a 17-foot bosh and an 11-foot stock line. A small furnace was also built in 1848 at East Moriah, some four miles back from Port Henry, but did not enjoy a long life.

Old Bed 21 Mines.

The Old Bed mine, Joker and Bonanza shafts, of Witherbee, Sherman & Co., and the No. 21 mine of the Port Henry Iron Ore Co., all of which deposits are of practically the same ore body, form by far the most productive and most interesting group of this section. As may be seen from the accompanying map, Fig. 2, the Joker and Bonanza workings are connected. Each shaft is provided with two skipways, those in the Bonanza having a vertical descent of 400 feet, then making a vertical turn and following a 16-degree incline for about 325 feet, from which there is a final vertical descent to the bottom of the workings. The Joker skipways reach the same workings, but one of them terminates in the upper level while the other serves the level below.

This method of mining is rendered desirable by the peculiar form of the ore deposit. There is a central horse of gneiss folded up within the main body of ore, so that a cross section of the deposit roughly resembles that of a T rail. The division between the ore and the gneiss is extremely sharp and the character of the rock is such as to furnish an ideal roof. There is absolutely no timbering in any of these mines; in fact, no method of timbering could be satisfactorily employed in mining operations on the scale developed in the Joker and the Bonanza, as there are certain places where the ore body reaches a vertical height of 300 feet. In the place of timbering, heavy pillars of ore are left standing at various intervals, some of these being 35 feet in diameter, and

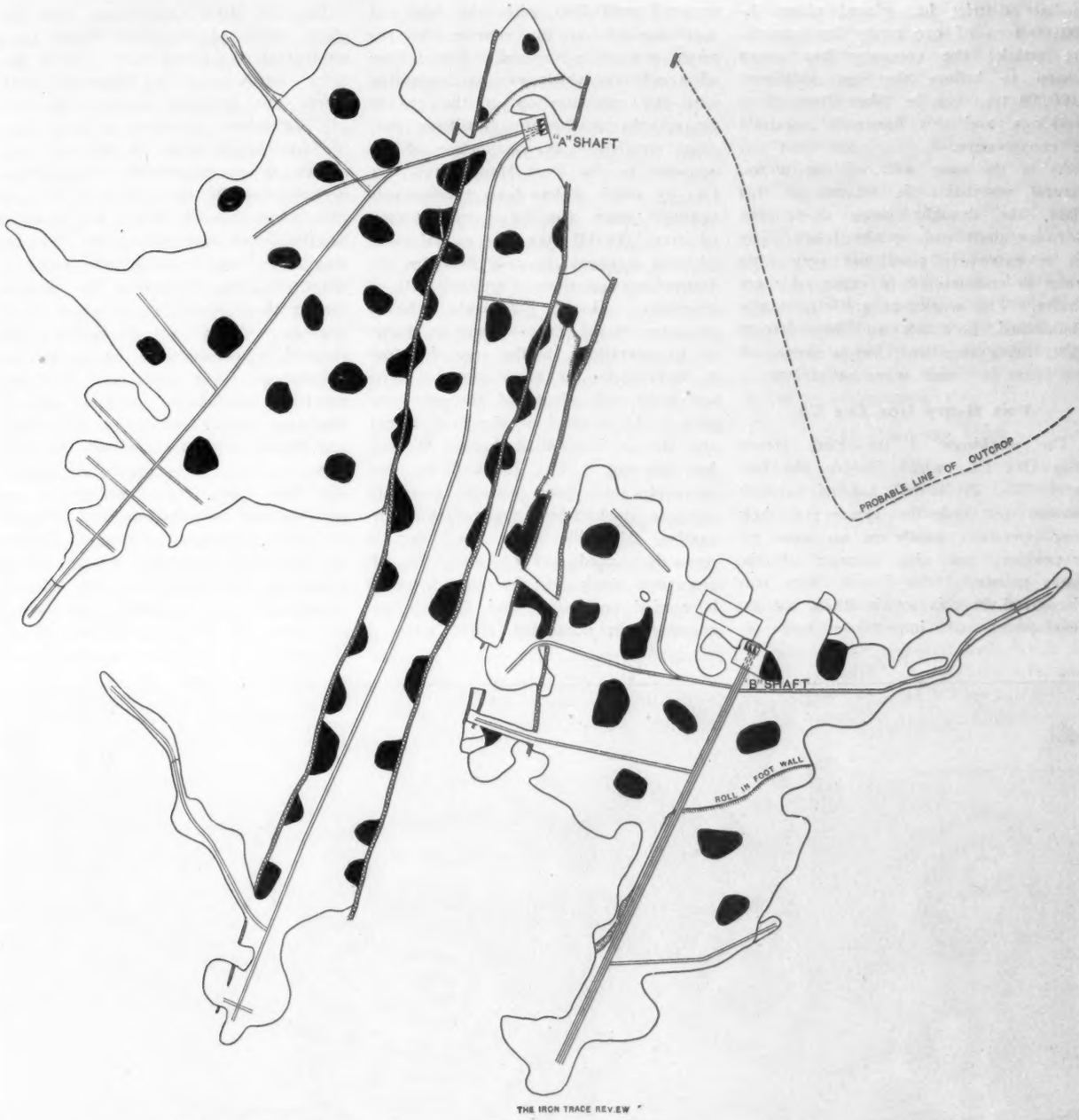


FIG. 3—UNDERGROUND WORKINGS AT THE HARMONY MINES, CORRECTED TO JUNE, 1909.

it is estimated that the pillars in this one group of mines now contain in excess of 800,000 tons of ore. In case the deposits are exhausted and the workings are to be abandoned, it is probable that these pillars can be removed without danger. This body of ore runs low in silica, but has a high iron and lime content and considerable phosphorus.

Some 18 months ago development work was started in the southern part of this deposit on an extensive scale, the plan being to open up a new level about 60 feet below that of the old, but in the same ore body. On this lower lever a drift has been driven in elliptical form and the work is now under way of installing an electric locomotive system to tram the ore to the skips. This is the first instance of electric haulage at these mines, as hand tramming heretofore has been exclusively employed. Near the foot of the Joker shaft a pocket with a capacity of about 1,000 tons of ore has been cut in the horse rock. The cars are to be run into a rotary tripple immediately over this pocket, where three of them with a capacity of 3 tons each can be dumped at once. From this pocket 3-ton skips will be loaded and hoisted to the shaft house, a distance of about 900 feet, on a practically uniform slope of 78.5 degrees from horizontal.

At intervals of about 75 feet raises have been made from this elliptical drift to the other level, and through these raises the solid ore will be broken down. This will mean practically no handling of the ore, as a large part can be loaded directly on the tram cars from chutes properly located at the bottom of the raises. The storage pocket arrangement will add considerably to the flexibility of operations, as there will be no necessity for delay when the hoisting facilities are overburdened and the hoists can operate independently of the mine operations. It is estimated that the driving of this elliptical drift and other development work in this im-

mediate district has placed about 1,500,000 tons of ore ready for immediate attack; the company has every reason to believe that an additional 9,000,000 tons can be taken from these workings, and this figure is regarded as conservative.

As is the case with all the mines, natural ventilation is secured at this place, the draught being down the Bonanza shaft and up the Joker. The air is extremely good and very little water is encountered in either of these shafts. The workings are electrically illuminated, both arc and incandescent lights being employed, but a cluster of the latter is found more satisfactory.

Port Henry Iron Ore Co.

The workings of the Port Henry Iron Ore Co., which include the historic "No. 21 Mine," are of peculiar interest not only by reason of their long operation, partly as an open pit proposition, but also because of the heavy nature of the deposit. Ore was discovered in this lot in 1825, but no development of importance was attempted until 1846, when the vein was first worked on the outcrop by the room and pillar method. The failure of a concern which was experimenting with the concentration of the ore to recover the apatite for fertilizing purposes resulted in the acquisition of the property by the Port Henry Iron Ore Co., by which it has been continuously operated since, yielding a total output of over 5,000,000 tons. The capital stock of this company is now held by the descendants of those identified with it originally: H. N. Brinsmade, who is treasurer of the company and in charge of its operations, is the son of James B. Brinsmade, for many years a moving spirit and official of the old company. The product of the Port Henry Iron Ore Co. is handled through Witherbee, Sherman & Co., Inc., and the two companies enjoy close relations; there are common stockholders, the railroad connecting Mineville with the lake is mutually owned and operated, the engineering work of the two interests is carried on jointly and there is cooperation in numerous other ways.

The "21 Mine," which has been the chief source of the Port Henry Co.'s production, is located only a short distance north of the Bonanza shaft, where this property corners into that of Witherbee, Sherman & Co., Inc.; in fact, the workings of the two companies at a considerable depth have broken through into each other. At first, when the "21 Mine" was operated by the room and pillar plan, the ore was taken out by a double track inclined skipway, following the general dip of the footwall at an angle of 57 degrees. After the workings had reached a considerable depth, it was decided to shoot down the roof and overlying burden in order to recover the large tonnage of ore in the pillars and floors. This transformed the mine into an open pit proposition, roughly 300 feet deep, from which the ore was hoisted by the inclined skipway and two cableways. This plan yielded an important tonnage of ore at an extremely low cost, but also imposed a constant pumping burden because of the pit's wide area. Some idea of the

FIG. 4—PORTION OF SIDE OF OPEN PIT AT "21 MINE," SHOWING MAGNITUDE OF PILLARS AND VEIN. SECOND SERIES OF ROOMS IN LOWER RIGHT HAND CORNER.

size of these pillars can be gained from the accompanying illustration, Fig. 3, which shows a portion of the "No. 21" open pit.

After the removal of the large pillars, there was a return to the old style of working levels—room and pillar method. The vein was extremely heavy, ranging up to 250 or 300 feet vertically, and a roof of ore was left to guard against slides from the faces of the pit. That this was a wise precaution was demonstrated in February, 1905, when the collapse of a pillar was followed by the falling of one side of the pit, covering the ore floor to a great depth, tearing out a good part of the hoistway and rendering the pumps ineffective. The interesting story of how the skipway was reclaimed and anchored to the footwall by heavy cables attached to iron plugs, while the shaft was continued down through the drift, has been told by the mining engineer, Guy C. Stoltz, in the *Engineering and Mining Journal* of March 20, 1909. These workings are now operating normally, and the possibility of future difficulty through the collapse of the pit walls has been eliminated.

New Shaft and Headframe.

The Port Henry Iron Ore Co. recently undertook a number of important improvements on its properties, the most noteworthy being the sinking of a shaft to reach the "No. 21" vein at a depth of about 600 feet. This shaft, which is called the Clonan, honoring the company's mine superintendent, is now down to a 540-foot level and eventually will go considerably deeper, as the hoist equipment has a capacity of 1,000 tons in ten hours from a 1,000-foot level. This shaft is vertical; it measures 20 x 6 feet and is a triple-compartment, accommodating two of the new Kimberly skips and a ladder way. It is interesting to note that the sinking of this shaft has been accomplished without the death or injury of a man. The headframe for the Clonan shaft, which will be of steel, will be ready for operation by October. It will be equipped with Gates crushers, and is unique in that a double dump is provided, one for each skipway. There is also provision for hand-picking, although very little rock is found in the run-of-mine, and the storage bins have a capacity of 1,000 tons. The engine and hoist house is of concrete blocks; the boiler capacity is 300 horsepower at 150 pounds pressure, and Sullivan balanced hoists are now installed.

The "21" vein was extremely heavy at the outcrop, forming the present pit, and retained these proportions to a considerable depth. Eventually, however, the same horse of rock occurring in connection with the Joker-Bonanza workings was encountered. This divided the deposit; the vein following the hanging wall, which has been mined out for some distance, averages about 40 feet in thickness, but shows a very material increase after the shoulder of the horse is passed, and in certain places the ore body has been found to encircle the rock completely. The vein following the foot-wall is much heavier. In taking the ore out of the "21" workings, the longest tramming is only 600 feet; nothing would be gained by electric haulage and the new shaft has been purposely sunken at such a location as to accommodate hand tramming. There are no ore pockets in the workings, the plan followed being to load directly from the tram cars, two cars to a skip, the latter's capacity being three and one-half tons. The rooms are generally very large and arc lamps are employed with satisfactory results.

No accurate estimate of the probable tonnage in the Port Henry Company's properties is possible, as only a limited amount of exploration work is carried on. That, however, has been sufficien[illegible] to show up at least 2,000,000 tons, and this figure could be heavily increased at any time by more extensive prospecting. Aside from the "21 mine," it is known that the Port Henry Iron Ore Co. has still considerable Fisher ore near the Smith mines, but is not operating there at present. Following the slip of 1905, which made it impossible to mine at "No. 21" for some time, the company reopened its Welch shaft, located about 600 feet north of the open skip house; from this shaft about 120,000 tons has since been taken and it is still producing at a good rate, although when it was originally shut down the estimate was that not over 30,000 tons remained.

The Harmony Mine.

About a half mile south of the Old Bed 21 group, Witherbee, Sherman & Co. have made important developments in what is known as the Harmony mine. Two shafts tap this deposit, "A" and "B," their location being shown on the accompanying map, Fig. 3. In the former, development work is now under way and four levels are being extended out into the ore body on either side, while tracks will be connected from the workings between

FIG. 5—STEEL HEADFRAME AT JOKER SHAFT. 125 FEET IN HEIGHT. EQUIPPED WITH CRUSHERS AND 1,000-TON STORAGE BIN. MODERN TYPE OF SHAFTHOUSE.

the dykes toward the western extension. Operations are still under way at this shaft in a very heavy vein and the end has not yet been reached. At shaft "B" a pit has been opened in 75 feet of ore and an enormous tonnage is now available at this point. It is estimated that considerably more than 600,000 tons of ore is in position for immediate attack at this point and probably 8,000,000 tons additional will be secured before the Harmony deposits are exhausted. The thickness of this vein varies from 15 to 75 feet, showing considerable irregularity. Some water has been encountered in these workings, though not enough to cause any particular inconvenience. The two shafts are electrically operated. The product of these mines is electrically cobbed and will run about 63 per cent in iron, with phosphorus slightly over 0.1. The ore is coarse and granular; by cobbing before concentrating, the pieces of pure ore up to two inches are picked out, and these, added to the finer concentrates, give an ore of physical character well suited for blast furnace use. The rejections from the cobbing machines, before being crushed further for concentration, find a ready sale for blast furnace use where silicious ores are required.

Barton Hill Mine.

This important New Bed deposit is located about a mile northeast of the other workings and consists of two underlying veins ranging up to 30 feet or more in thickness. The outcrop of this deposit extends over a distance of two miles, embracing also the Burt mine of this company and the Fisher Hill mine of the Port Henry Iron Ore Co., both of which are shown in Fig. 1. The Barton Hill mines have already been worked for some time, although they have not been the scene of activities during the immediate past. It was in one of this group that the famous "Lovers' Hole" was encountered, from which there was shipped over 60,000 tons of Bessemer ore, running 70 per cent of iron or better. It is admitted that this pocket of ore, which was practically a mass of crystals of nearly pure magnetite, was the richest ever developed in the United States. All the ore at this mine is within the Bessemer limits and about one-quarter of it runs 60 per cent in iron.

The Barton Hill mine has been the scene of vigorous development work within the past few months. A new adit has been driven a distance of 2,000 feet into the hill, of which about 1,500 was through the old workings. Trial holes have proven that the ore-bearing territory extends at least 2,400 feet to the west and 3,000 feet north and south, which means a deposit of at least 1,000,000 tons per foot of vein. There is no reason to believe that this vein will average less than eight feet in thickness, which would mean at least 8,000,000 tons. Recent extension of the old work has placed about 200,000 tons in shape for immediate mining. It is probable that a concentrating mill will be installed at the mouth of this mine to bring up the iron content. Originally the Barton Hill mines were operated by shafts sunk in the top of the hill, necessitating the hoisting of the ore and considerable pumping, but the present workings enter the hill near its base and follow the vein, doing away with the necessity of hoisting the ore and pumping.

Other Mining Properties.

Some two miles north of the Old Bed operations is the Smith mine, which was pumped out in 1903 after having been full of water for about twenty years. Recent development work at this place showed up a vein of superior ore averaging about six feet in thickness, chiefly on the south and south-eastern side. Probably 50,000 tons has been proved up at these workings, with about four times that amount in sight. Numerous squeeze formations in the rock give these deposits a pod-like nature to a greater extent than is true in the other workings. In addition, it is estimated that ore bodies as yet only partially explored, on Lot 75, about a mile north of the Fisher Hill workings, will show up about 1,000,000 tons.

The Joker Shaft House.

The most modern instance of shaft house construction is the new head frame at the Joker shaft, Fig. 4, which has been in operation but a relatively short time. Of steel construction throughout, the design of this head frame probably represents as high a development in this class of work as can be found anywhere in this country. Its total height is 125 feet. An automatic dumping device in the skipways handles the loads of the 3-ton skips as they come from the mine, throwing their contents into a small pocket at the extreme top of the structure. At the bottom of this pocket the ore runs over grizzly bars spaced four inches apart, through which the finer material descends directly into a 1,000-ton storage bin. The ore going over is deposited in a steel hopper, from which it is driven out over a grizzly having 6-inch spaces. The lumps larger than 6-inch are carried automatically into a 50-ton lump ore bin, ready for shipment to open-hearth plants and puddling furnaces for fettling. The wide favor which the Port Henry magnetites have found for these purposes is due to their possessing the peculiar character that when the heat strikes them they do not go fine; the gangue being largely phosphate of lime, they are self-fluxing and prolong the life of the furnace linings. These ores are low in silica and contain practically no sulphur, yet will run over 60 per cent in iron, a combination which has made them in demand in almost every rolling mill east of the Allegheny mountains.

The ore which drops through the 6-inch space goes directly to a 30 x 18-inch Blake crusher, by which it is reduced to four inches, and is then deposited in the 1,000-ton bin previously referred to, the crusher being located immediately above it. Underneath this bin there is a headroom of 18 feet, enough to admit the largest railroad car for loading purposes. From this bin shipments are made directly in foreign cars as "Old Bed 21 crude furnace ore," or else it is loaded into small jimmies and sent to the mills for concentration. By the latter process it is possible to reduce very materially the phosphorus content of the Old Bed ores, where their usual phosphorus content is not desirable.

The Joker shaft house is of steel frame work, sufficiently heavy to provide a rigid support for the head sheaves, crusher and other equipment described. The large storage bin rests on concrete foundations. The shaft building is covered with heavy galvanized iron. It was first put in operation in September, 1908, and has a hoist capacity of 1,000 tons in ten hours.

In this connection it may be noted that the daily tonnage possible at the present workings is limited only by the capacity of the hoisting equipment. Operations have reached such a depth that the problem of conveying the men to and from work has become a serious one, particularly as the number of employes ranges up to 1,200 or 1,500 and the practice is to bring all to the surface at the noon hour. To lessen the time lost in this manner, a 3-deck man cage, accommodating 30 men in all, has been adopted. After the practice followed in deep operations in certain Western mines, the cage is arranged to replace the ordinary hoisting bucket during the rush periods, and aside from showing a material saving in time is of additional comfort to the underground men.

The Concentrating Plants.

The Port Henry ores, being coarsely crystalline in nature and easily disintegrated by crushing, lend themselves admirably to concentration, and, because of the low cost of this operation, coupled with the remarkable results secured, the product of these mines in very large part is shipped in the shape of concentrates. It is interesting to note that the first magnetic separating plant installed at these works, in 1853, had as its principal object the recovery of the phosphate rock or apatite, which was exported for fertilizing purposes, the ore resulting from the operation being sold as a by-product. Special pulverized apatite, produced as tailings in the concentration of "Old Bed" ores, finds an extensive market as a fertilizer for soils deficient in phosphorus; this runs from 15 to 18 per cent in phosphoric acid and from 30 to 35 per cent in lime.

The present concentrating equipment includes two mills with a capacity of treating about 800 tons in 10 hours. Arrangements have been made for the installation of an electric cobbing machine just before the dryer in Mill No. 2 and ultimately the plan is to provide a separate concentrating plant for Barton Hill and another for the Harmony mine, leaving the entire present capacity free for operating on the Old Bed ores exclusively.

Although in general the same methods are followed at both mills, there is a distinct difference in the problems encountered in concentrating the Old Bed and the New Bed ores. The latter average low in phosphorus, but are somewhat irregular in iron content, the range being from 40 to 69 per cent, and the object in this connection is principally to bring up the lower grade ores and turn out a product of uniform richness. In the case of the Old Bed ores, however, the problem is chiefly the elimination of the apatite or phosphorus bearing gangue, as the phosphorus content ranges from 1.00 to 1.60 per cent, while the iron content is never far from 60 per cent. This operation is in reality one of purification. The gangue being practically non-magnetic, these ores lend themselves admirably to electrical treatment after crushing and a steady lowering of the phosphorus percentage has resulted from improvements made since the process was originally installed on an extensive commercial scale at these workings some seven years ago. So complete has been its success that the plants now in place have been visited and studied by numerous engineers engaged on similar problems in this country, in Canada and abroad.

The Mineville mills are operated dry, the character of the ore being such that no injurious fines result and there is comparatively little dust. Near Harmony B shaft is located a cobbing plant equipped with heavy crushers of the Blake type, from which the crushed material is handed by belt conveyors to a bin over a Ball & Norton single drum separator. This, in its latest form, is considerably more effective than the original installations. The drum measures 48 inches in diameter and has a 30-inch face. Its magnets are wound to give a much stronger magnetic field, the present capacity of the machine being 100 tons per hour, picking out the pieces of ore up to 2½ inches, as against 1½ inches originally. This not only relieves the mills to an important extent, but makes it possible to ship a somewhat coarser product without any reduction in the iron content. After treatment, the cobbed ore and tailings are carried by belt conveyors to storage bins conveniently located for shipment, the former direct to the furnaces and the latter to Mill No. 1 for concentrating.

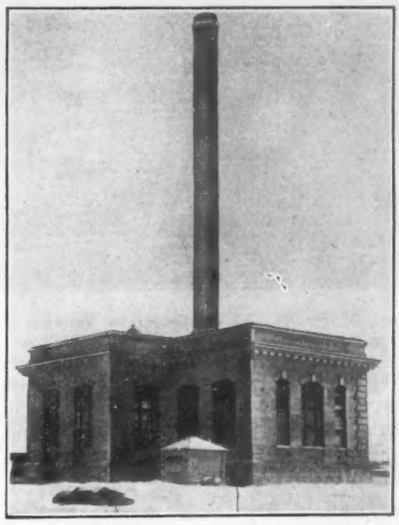


FIG. 6—PORT HENRY POWER HOUSE (STEAM TURBINE STATION) ON SHORE OF LAKE 5 MILES FROM MINEVILLE. BUILT OF CONCRETE.

Mill No. 1, which treats the crude ore from the Harmony workings and the tailings from the cobbing plant, and Mill No. 2, which handles the Old Bed product, are very similar in operation, and the latter will be briefly described. As the ore comes from the cars, it is weighed and passes into a bin from which it is fed into a 30 x 18-inch Blake jaw crusher, operating 250 revolutions per minute, after which it goes over a ¾-inch screen, the oversize then passing through a 36 x 6-inch Blake two-jaw crusher, 225 revolutions per minute, after which the screened and crushed products unite and go over a 6-mesh screen. The oversize is further treated in a set of 36 x 14-inch Reliance rolls, running 100 revolutions per minute, after which it joins the screened product and all is conveyed to the top of the dryer.

This is a square, vertical structure, of large "old furnace" brick, with a glossy, vitreous surface and high silica content. It is fitted with baffle bars arranged at right angles to one another in alternate sections. These bars are cast iron tees, with a 5-inch face, and are in horizontal rows, 6 inches apart vertically and staggered. As the body of the ore falls over these bars, it is so broken up as to prevent a free circulation of heated air, which is admitted from a bottom grate. The capacity of the dryer is increased by reason of a bridge wall and outside furnace, as the gases from the latter divide and pass partly up the chimney. The latter is close to the shaft of the dryer and is connected with it through several openings, serving to admit or exhaust gases.

From the bottom of the dryer, the ore is carried to a tower screen, the large surface of which is divided into equal sections of 30, 16, 10 and 6-mesh, the oversize going to another set of rolls and thence again to the screening surface. The finest screens are placed highest so that more effective sizing may result from the coarser particles scrubbing the finer through. The crushing and drying operation is now complete, and the product of each screen is deposited in a separate pocket in a bin, ready for concentrating. By means of frequent screening and the elimination at each stage of all except the coarser ores, there is little pulverization, and of the total shipping product about 65 per cent is larger than 10-mesh.

(To be continued.)

Consul George Ifft, Nuremberg, has transmitted a report to the state department on the wages paid by concerns connected with the South German Iron and Steel Association, of which there are 12,493 employing 210,689 workmen. The average earnings of fully employed journeymen workmen in 1908 was $283.94 which was $3.81 more than was paid the year before. Not counting Sundays and omitting 20 holidays the average daily wage was less than 97 cents.

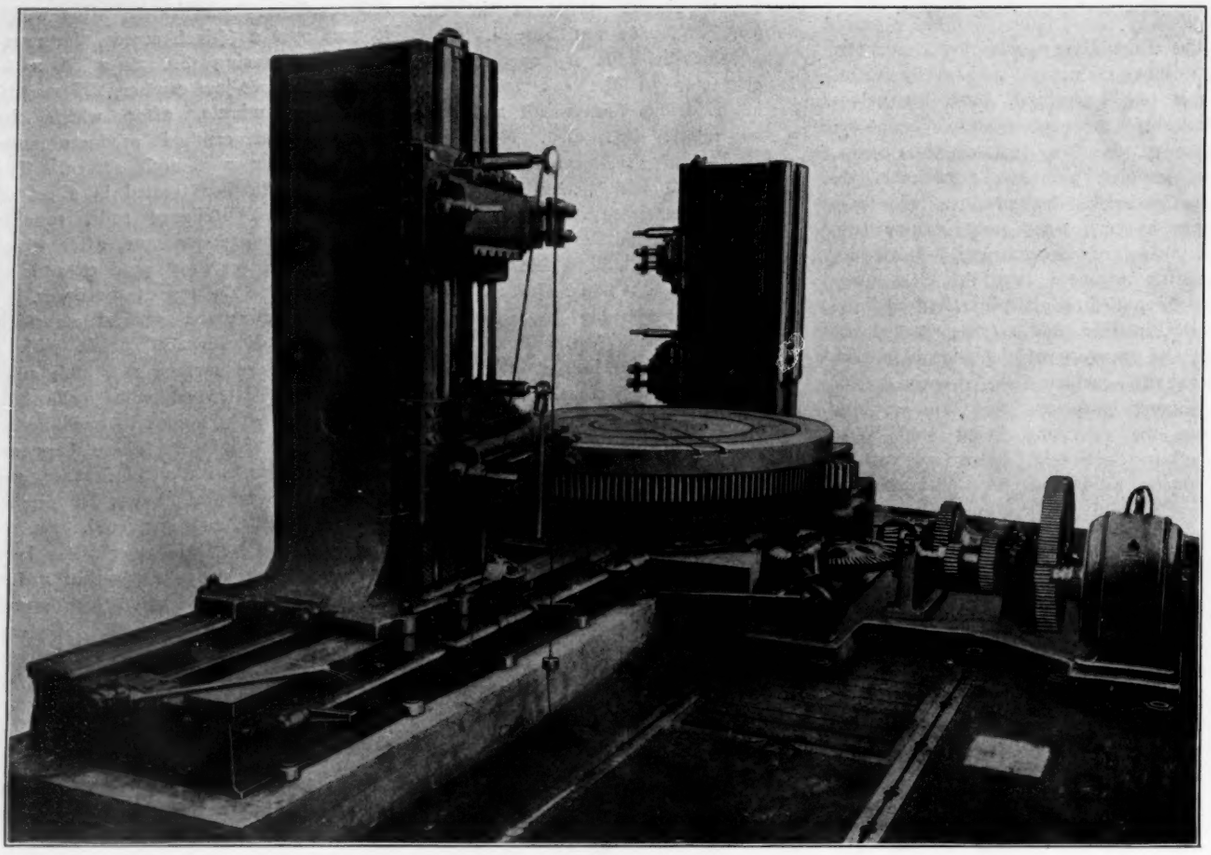


FIG. 1—VERTICAL TURNING MACHINE, ERNST SCHIESS WORKS, DUSSELDORF, GERMANY.

TWO LARGE GERMAN MACHINE TOOLS.

Illustrated herewith are two machine tools of unusually large capacity, built by the Ernst Scheiss Works, Dusseldorf, Germany.

The first, shown in Fig. 1, is designated as a vertical turning machine and, as will be seen, is of novel design and not without striking and valuable features. We are without information as to the special class of work for which this machine is designed, but it evidently does not involve dealing with boring operations. The machine has a capacity for work up to 32 feet 10 inches diameter and 5 feet 3 inches in height, and weighing up to about 85 tons. The table is 13 feet in diameter and is carried on a V track in the base plate and on a central step, and its upper surface is provided with the usual T slots. The arrangement of the table drive is plainly shown. The base plate is extended on opposite sides to carry two columns, on each of which are mounted two tool saddles. The columns are adjusted on the beds by hand and the saddles have hand movement on the columns for rapid adjustment, and automatic vertical feeds through the rock shaft and chain shown. The tool slide on the lower saddle is arranged to swivel to any angle, and both have automatic horizontal travel through 25½ inches. The tool movements of the saddles on either column are independent of each other. The total weight of the machine is about 80 tons. The machine is driven by a 50-horsepower motor, and all gearing is cut, the larger gears being of steel.

Fig. 2 shows a type of machine common to most American shops, the striking feature being its great size. The machine has a capacity for work up to 39 feet 4½ inches diameter, 11 feet high. The work table is 36 feet 1 inch diameter and its height above the floor level is 5 feet 2 inches. The table runs in a V track in the base plate, 16 feet 5 inches diameter, and is also provided with an adjustable central step bearing and six outside bearings. The total length of the cross rail is 52 feet 6 inches, with a height of 4 feet. The rail carries two tool saddles, which can be swiveled to 45 degrees, and all movements of rails and saddles and rams are automatic. The method of balancing the rams is something of an improvement upon the method common in the United States, in which the effort of the counterweights, through the chain, to withdraw the arm is constant, regardless of the angle to which the head is swiveled, so that in some operations the feed gear has not only to overcome the strain of the feed, but must also lift the counterweight. The machine is driven by an 85-horsepower motor, giving a speed range to the table of from 0.09 to four revolutions per minute. The total weight of the machine is about 330 tons.

In neither of these machines are the designed cuts equal to what would be demanded of such an expensive tool in the United States. For instance, in the machine shown in Fig. 1 the total chip section taken by four tools is designed to equal 0.155 square inch in cast iron and 0.077 square inch in cast steel of 65,000 pounds per square inch tenacity, at 40 to 50 feet per minute. The second machine is designed to deal with two cuts having a total section of 0.155 square inch in steel having a tenacity of 130,000 pounds per square inch at 11.7 feet per minute, on a diameter of 30 feet 2 inches.

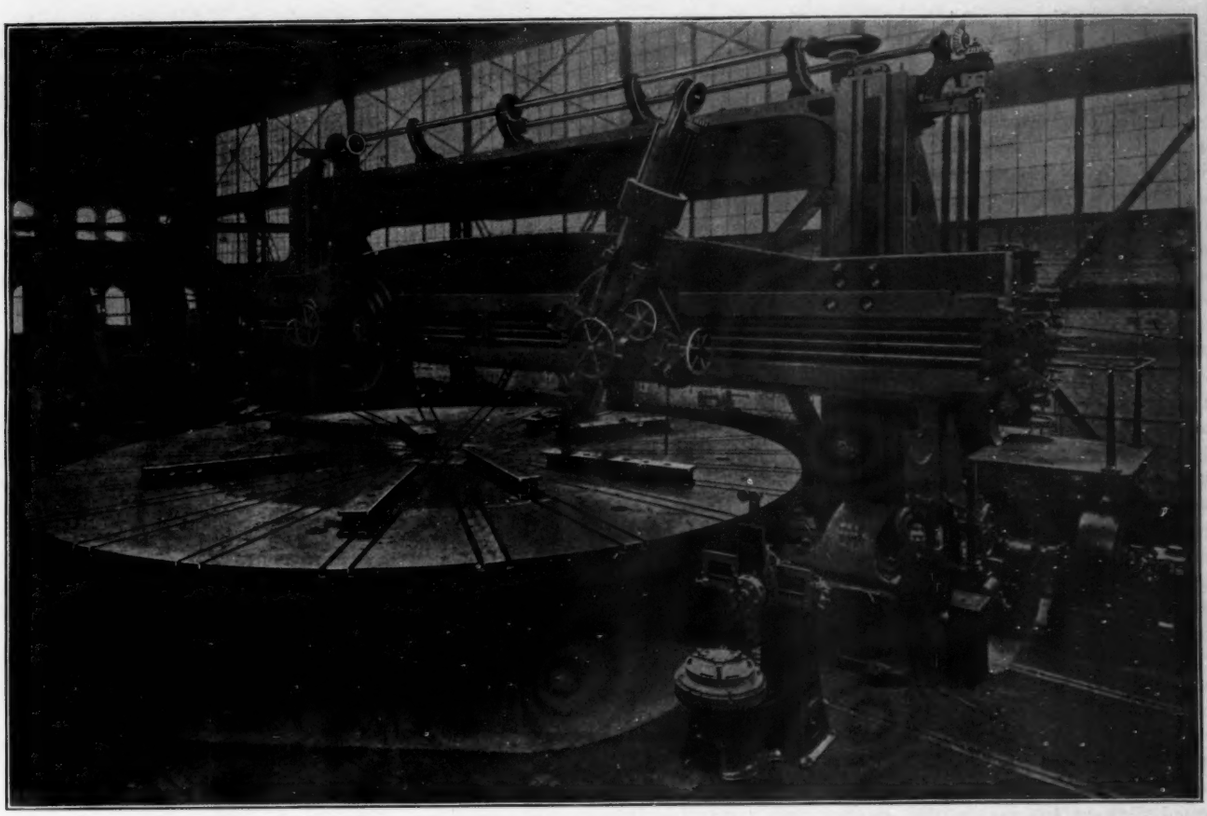


FIG. 2—VERTICAL BORING AND TURNING MILL, ERNST SCHIESS WORKS, DUSSELDORF, GERMANY.

Steel of such characteristics as that specified above, however, is seldom met with in practice, and, in fact, is only found in high-grade armor or similar material.

POWDERED FERRO-TUNGSTEN.

Considerable interest has been aroused among British and continental makers of tool steel by the introduction of ferro-tungsten in powdered form, brought out by a Bavarian concern. The new product is unique in that it is a true alloy, in contrast with the purely mechanical mixture of fine particles of the constituent materials often revealed in ferro-alloys by a strong microscope or by a magnet, and yields no separation of iron even by long-continued action of chemical reagents. The alloy is prepared direct from the tungsten ore and is of remarkable purity, a sample analysis running: Tungsten, 85; carbon, 0.30; silicon, 0.45; manganese, 0.45; aluminum, calcium and magnesium together, 0.25; and sulphur, 0.01. To produce such an analysis, the ore must be free from arsenic, copper, tin and phosphorus.

Metallic tungsten, running 96 to 98 per cent, has a very high melting point, whereas the alloy, melting at a considerably lower point, and much nearer that of iron and steel, alloys more readily, the development of the metallic carbides proceeding more easily. In addition, the alloy's capacity for oxidation being less than that of the pure metal, there is practically no waste of the costly tungsten material through the slag. The steel resulting from the use of this alloy pours in a highly fluid state. The lower specific gravity of the powdered ferro-tungsten is also an advantage, inasmuch as considerable difficulty is encountered at the beginning of the process through the tendency of pure tungsten metal, with its higher specific gravity, to settle to the bottom, thus requiring vigorous mechanical mixing by repouring to secure a thorough mixture with the steel.

The experience of foreign steel tool makers with this alloy is also to the effect that its use tends to reduce piping in the ingots and the formation of cavities; the malleability of the steel is also improved, adapting it well for forging purposes. This product is made by the Chemische Fabrik Fuerth, of Fuerth, near Nuremberg, Bavaria, which is represented in the United States by Vivian, Bond & Co., 68 Beaver street, New York.

PROGRESS IN ELECTRIC CURRENT DEVELOPMENT IN THE ARTIFICIAL LIGHTING FIELD.

(Continued from last issue.)

The first incandescent lamps, which were introduced commercially in the early '80s, were made by carbonizing a vegetable fiber, such as a thread or a strip of paper. Weston employed structureless cellulose, producing for the first time a homogeneous carbon filament, which he called "tamedine." He also invented the "flashing process," now generally used, which consists in heating the filament to incandescence in a hydro-carbon vapor whereby a dense carbon coating is deposited upon the filament. This made the carbon filaments much more uniform and marked a decided advance in the incandescent lamp. Edison developed the bamboo filament and used this for a number of years. Later all carbon filaments were made by squirting through a die a thick solution of cellulose made from substances such as cotton, then treating, carbonizing and flashing, and this is the method generally employed today.

The early carbon filament lamps required 5 to 6 watts per candle, but improvements in the manufacture of the filaments had improved this specific

power consumption to 3.1 watts per candle by about 1888. The high efficiency lamps, having a specific consumption of 3.1 watts per candle, could, however, only be used on circuits having close voltage regulation, as otherwise the life of the lamp was greatly reduced. No radical improvements in carbon filament lamps were made for over 15 years until about 1905, when the metallizing or graphitizing process for treating carbon filaments was developed. This process consists essentially in subjecting the carbon filament to the high temperature of an electric furnace with the result that the filament is partly or wholly graphitized. The filament is then "flashed" and subjected to the electric furnace for a second time. The graphitized or metallized carbon filament lamp, known also under the trade name of "Gem Lamp," has a specific power consumption of 2.5 watts per candle, with the same normal life as is obtained with the ordinary carbon filament lamp. A further remarkable change produced in the carbon filament by the metallizing or graphitizing process is changing the temperature coefficient of resistance from negative to positive, so that the treated filament behaves in this respect like a metal. This positive temperature coefficient makes the lamp much less influenced by fluctuations in the supply voltage.

Since the beginning of this century incandescent lamps containing filaments of metals and giving efficiencies much higher than could be obtained with carbon have been introduced. Osmium was the first metal tried and a fairly satisfactory lamp, having a specific power consumption of 1.5 watts per candle, was obtained. A number of osmium lamps have, in fact, been used commercially in Germany. However, the very limited available supply of osmium has prevented the commercial introduction of the osmium lamp on a large scale.

About the year 1904 lamps employing tantalum filaments were placed on the market, having an efficiency of about 2 watts per candle, with a useful life greater than that of the carbon filament lamp on direct current circuits. Processes were developed for producing pure, ductile tantalum which was then drawn into fine wires for use in the lamps, and these tantalum lamps have come into considerable commercial use. A peculiarity of the tantalum lamp is that it has a short life when used on alternating current. The lamp is, therefore, inherently a direct current lamp.

About the year 1905 incandescent lamps, having filaments of tungsten, were brought out in Germany, having an efficiency of about 1.25 watts per candle with a useful life claimed to be greater than that of the carbon filament lamp and equally good on alternating and direct current. These were quickly introduced on a large scale. The manufacture of tungsten lamps was also started in America about 1907, and these lamps are now rapidly coming into use. The present very high cost of these lamps is, however, a serious obstacle to their general introduction. Since tungsten is not ductile, the tungsten filaments cannot be drawn into fine wires as in the case of tantalum. The production of a filament of tungsten, therefore, presents many difficulties with the result that a number of different processes for producing these filaments have been developed. Since the specific resistance of tungsten is very much less than that of carbon, a filament of tungsten for a lamp to be operated at a given voltage must be very much thinner and longer than a carbon filament for the same voltage. For this reason tungsten filaments are admirably suited for heavy current, low-voltage series lamps for use on constant current circuits for street lighting. Multiple lamps for 110-volt, constant potential circuits are now also manufactured in sizes down to 20 candle power, but the filaments in these lamps are extremely small in diameter. When the tungsten filament is incandescent it is extremely soft, and the loops, especially those for high voltage lamps, require supports to keep them in position. The first tungsten lamps were for this reason capable of operating only in a vertical downward position. The lamps have been so improved that they can now operate in any position. The tungsten filament is, however, extremely fragile, making it liable to become broken when subjected to vibration, so that these lamps are not suitable where subjected to vibration, as, for instance, on trains or boats. In these latter places the tantalum lamp is frequently used.

Both the tantalum and tungsten filaments have a positive temperature coefficient, and for this reason are less affected by fluctuations in line voltage than ordinary carbon filaments. The light given by tantalum and tungsten lamps is also much whiter than that given by carbon filament lamps owing to the higher temperature at which these filaments are operated. Another peculiarity of these metal filament lamps is that they do not depreciate from their initial candle power until the filament finally breaks. It is at times even possible to repair a ruptured tantalum or tungsten lamp filament by judiciously shaking the lamp with the voltage on, until the broken ends of the filament come in contact and are welded together by the intense local heat at the point of contact. Such a weld is frequently quite strong, enabling the lamp to continue in service for a considerable time.

A prominent example of an installation of tungsten lamps for street and park lighting is found in Riverside Park and Riverside Drive, High Bridge Park, and St. Nicholas Park, New York City, where the New York Edison Co. has recently installed about 300 75-watt 60-candle power tungsten lamps, mounted on lanterns of special design and carried by ordinary posts about 10 feet high from the surface of the ground. These lamps are supplied in multiple from the ordinary Edison three-wire system by means of buried cables, making it an unusually attractive lighting installation. This installation is described in a paper by S. G. Rhodes, in the February, 1909, issue of the "Transactions of the Illuminating Engineering Society."

Another form of incandescent lamp which has been proposed but which has not been introduced commercially, is the Helion lamp invented by Messrs. Parker and Clark, of New York City. The filament for this Helion lamp is made from a carbon filament by subjecting it to heat treatment in a gaseous compound containing silicon. It is stated that the filaments take on a surface deposit of silicon, and, with this surface deposit, a greatly increased efficiency and a much greater whiteness of light are obtained. A desirable quality of the Helion filament is its very high specific resistance, giving a comparatively short and thick filament for 110 volts and making the lamp suitable for higher voltages. A peculiarity of the Helion lamp is that it does not require a vacuum for its operation, but can be used in the open air.

The advance made in the construction of incandescent electric lamps is well shown by the following table, giving the approximate dates when each lamp was introduced in America, and the specific power consumption expressed in watts per mean horizontal candle and in watts per mean spherical candle. The latter figures are obtained from the former on the assumption of a spherical reduction factor of 0.8.

An interesting departure in the construction of an electric lamp of the incandescent type is the Nernst lamp, which was first brought out by Dr. Nernst, in Germany, about the year 1898. The Nernst lamp has been commercially developed in America by the Nernst Lamp Co., one of the Westing-

Type of Lamp.	Approximate date of introduction.	Watts per mean horizontal candle.	Watts per mean spherical candle.
Early carbon filament.....	1880	4 to 6	5.0 to 7.5
Improved carbon filament.....	1888	3.5 to 3.1	4.4 to 3.9
Metallized or graphitized filament.....	1905	2.5	3.1
Tantalum	1904	2.0	2.5
Tungsten	1906	1.25	1.56

house interests. The light-giving conductor, or glower, as it is called, consists of a cylindrical piece of porcelain-like material, from one-half to about one inch in length, for circuits of from 100 to 250 volts. This glower is made from a suitable mixture containing the oxides of rare metals, similar to that used in making Welsbach mantles. The peculiar characteristic of this glower is that it is an insulator when cold, but becomes a good conductor and an excellent and efficient illuminant when heated to a high temperature. It is, therefore, necessary to employ a device which will heat the glower on starting to a temperature at which it will conduct electricity, after which the current will maintain the glower heated and conducting. It is also necessary to provide an automatic cut-out for cutting the heater out of circuit after the glower has been made conducting. This heater consists in practice of a very fine platinum wire wound upon a small tube or thread of clay and placed close to the glower. The glower is not enclosed in a vacuum, but is surrounded by a glass globe to prevent too rapid dissipation of the heat of the glower. Another characteristic of this glower is that it has a negative temperature co-efficient, so that if it were connected to constant potential mains it would burn itself out after it has been heated and rendered conducting. In this respect it resembles an electric arc. For this reason a steadying resistance, called a ballast, must be added in series with the glower. In the Nernst lamp, the glowers take from 60 to about 120 watts, and, as made in America, from one to four glowers are employed in one lamp, giving from 50 to about 500 mean, lower, hemispherical candles. The heaters are placed horizontally above the glowers. Owing to the high temperature at which the glowers operate, a brilliant white light is obtained, which makes the light very desirable where colors should appear as nearly as possible the same as in daylight. The glowers and heaters have a life of 500 to 800 hours, and these are mounted together and are so arranged that they can be easily replaced. The ballast resistances have a life of several thousand hours, and can also be readily replaced. The first Nernst lamps manufactured in America were designed to operate on alternating current, and these gave only a short life on direct current. Later, Nernst lamps, giving a long life on direct current, were also introduced. Practically all of the light from a Nernst lamp is projected downward in the lower hemisphere, and hence no reflector is ordinarily required. The lamp is peculiarly well adapted for illuminating large interiors, such as stores, etc. These lamps have recently been greatly improved in efficiency, and the makers now claim a specific power consumption of about 1.2 watts per mean lower hemispherical candle. These Nernst lamps start in 20 to 30 seconds. A special Nernst fixture has also been placed on the market during the past year, in which the automatic cutouts and ballast resistances are attached to the fixture; the glowers and heaters are secured to a porcelain base and surrounded by a glass globe, the base having a screw contact attachment so as to permit of being replaced by unscrewing exactly like an ordinary incandescent lamp. Recently a luminous type of heater has also been developed which gives some light instantly, thereby producing a partial illumination before the glower has become active. It is claimed that with this new heater the glowers will start in 10 to 15 seconds.

Nernst lamps are generally used in multiple, on constant potential circuits, for indoor lighting. The largest single installation of Nernst lamps in America is in the Marshall Field & Co.'s stores, Chicago, where about 14,000 glowers are connected on direct current circuits, taking the place of about 57,000 16-candle power incandescent lamps. Nernst lamps can also be used on constant current alternating current circuits for street lighting by using a special form of series transformer for each lamp.

Development of Vapor Lamps.

Luminous effects produced by means of electric discharges through gases or vapors enclosed in glass tubes, exhausted to a partial vacuum, date back to the famous Geissler tubes, which were developed about the middle of the last century. These were, however, used only for lecture room experiments illustrating electric discharges, and no attempt was made to use them as sources of light. Electric lamps in which gases or vapors are raised to incandescence by an electric current have, however, been developed commercially during the past twenty years. The two leading types of vapor lamps developed in America are the Moore vapor lamp, or Moore tube, and the mercury vapor lamp.

The Moore tube was first described before the American Institute of Electrical Engineers, in 1896, by the inventor, D. McFarland Moore, and aroused considerable interest owing to its being totally different from other illuminants and embodying a number of remarkable properties. In its original form this lamp consisted of a glass tube containing highly rarefied air or other gases, and heated to incandescence by high potential electric discharges. The energy for exciting these tubes was derived from the inductive kick of a coil, whose circuit was rapidly interrupted by a mechanical break in a high vacuum. The chief difficulty found with these tubes was that the vacuum increased as the tubes were used until the electric discharges could not be forced through them, thus giving the tubes a comparatively short life. After about ten years of study and experiment, Mr. Moore finally overcame this difficulty by providing a most ingenious automatic feeder valve, called a vacuum regulator, which admits to the tube at suitable intervals a minute quantity of gas to supply the losses which occur during action. The color of the light in this lamp depends upon the gas within the tube, and for obtaining light of different colors tubes containing various gases have been made. For instance, ordinary air gives a light of a distinctly pink color; nitrogen, which can be obtained by drawing air over phosphorus to remove the oxygen, gives a golden yellow light, while carbon dioxide gives a white light. The Moore vapor lamp, as placed upon the market during the last few years by the Moore Electrical Co., of Newark, N. J., consists of a glass tube about 1.75 inches in diameter, and of a length varying from 25 to 200 feet. The ends of this tube terminate in a metal box, which contains all the auxiliary apparatus, and from which the tube proceeds over any desired path throughout the area to be illuminated and without any wires. The tube is excited from the secondary of a high potential transformer, whose primary is connected to the regular alternating current lighting circuit, the current being introduced through platinum wires sealed into the glass tube at each end and connected to carbon electrodes in the interior of the tube. The Moore lamp is, therefore, essentially an alternating current lamp, and requires a frequency of at least 60 cycles per second for satisfactory operation. The light from the Moore tube is of low intrinsic value, running in

practice in the neighborhood of 10 candles per foot of tube, this giving an ideal diffusion of light. As there is nothing which deteriorates in the operation of a Moore tube, its life is very long. An interesting and unique example of Moore tube lighting is to be found in the New York Post Office, where the mezzanine floor is entirely lighted by Moore tubes arranged in 35 parallel rows, each 114 feet long, placed directly under the ceiling.

Vapor lamps are not directly comparable with other sources of light in an ordinary photometer due to the large linear dimensions of these lamps, and, in the case of mercury vapor lamps, also due to the wide difference in color. These lamps should be compared with some form of luminometer by which the illumination produced is measured. From this a figure equivalent to spherical candle power can be derived. For the Moore tube a specific consumption of about 1.5 watts per equivalent candle power is claimed. Sharp and Millar report 2.49 watts per equivalent spherical candle power, for a Moore tube installed in 1907, in Assembly Room No. 7 of the United Engineering Buildings.

The mercury vapor lamp depends upon the production of an arc between a negative electrode of mercury and a positive electrode of mercury, carbon, iron, or other suitable conductor within a transparent tube, exhausted so as to contain only vapor of mercury. The mercury vapor lamp was developed by Dr. Peter Cooper Hewitt, in 1901, and was shortly afterward placed upon the market by the Cooper-Hewitt Electric Co., one of the Westinghouse interests. This lamp consists of a glass tube about one inch in diameter, and, for 110 volts, about 4 feet in length. The mercury vapor lamp is inherently a direct current lamp, but has recently also been manufactured for alternating current circuits. In the direct current lamp there is a positive electrode, usually of carbon or iron, at the upper end of the tube, and a negative electrode of mercury at the lower end; this end of the tube is provided with a condensing chamber, in which the vaporized mercury issuing from the negative mercury electrode is condensed and returned, thus constantly reconstructing this electrode. The positive electrode undergoes no change. To force an initial current through the mercury vapor of a lamp would require several thousand volts; after a current has once started, however, the voltage required to maintain the flow of current is comparatively low. The high resistance to starting is found to exist almost entirely at the surface of the negative electrode. The lamp is usually started by tilting the tube until the mercury bridges across the gap between the electrodes, thus striking an arc, and this may be accomplished by an automatic device. A special starting device, employing the high voltage discharge from an inductance coil, has also been developed. The mercury vapor lamp requires a steadying resistance or ballast in order to operate on constant potential like an arc lamp. A peculiar feature of this lamp is that if the current is interrupted for even the briefest possible moment the arc is immediately extinguished and cannot be re-established without first breaking down the resistance at the surface of the negative electrode. Thus the lamp can be made to operate only on alternating current by embodying the principle of the mercury vapor rectifier. Instead of the single positive electrode there are provided two positive electrodes, which are connected to the ends of the winding of a suitable transformer. The negative mercury electrode is connected through an inductance and a ballast resistance to the middle point of the transformer winding. The arc is started by means of an auxiliary starting electrode, as in the case of the rectifier. During the successive half waves, current flows from each of the positive electrodes through the vapor in the tube to the negative electrode. Thus the successive half waves travel down the tube in the same direction, and if sufficient inductance is present there is no perceptible flicker in the light. The most important characteristic feature of the mercury vapor lamp is its color, which is a bluish-green, corresponding to the spectrum of mercury. The light is practically void of red rays so that red articles appear black, and colors are generally distorted, which makes the lamp unsuitable for use where colors are to be matched or compared. These lamps, are, however, successfully used in machine shops, press rooms and similar places where details must be accurately seen, but where color distortion is no disadvantage. Owing to its very strong actinic rays, the lamp also has considerable value for photographic purposes. Dr. Bell gives a specific consumption of 0.6 to 0.8 watt per equivalent candle power for these lamps.

Cooper-Hewitt mercury vapor lamps have been constructed with tubes bent into a circular form, so as to fit in a diffusing globe. In some cases incandescent lamps have been added in the fixture for the purpose of supplying the red rays missing in the mercury vapor light. A prominent example of commercial lighting by units combining a Cooper-Hewitt mercury vapor lamp with a tungsten incandescent lamp, is found in the editorial offices of the New York *World*, where 36 of such light units have been in use since May 1, 1908. Each light unit or combination lamp, as it may be called, consists of a Cooper-Hewitt mercury vapor tube bent into circular form of about 10 inches diameter, with a tungsten lamp in the center. The vapor tube and tungsten lamp are attached to an ornamental metal fixture provided with a white, corrugated reflector and surrounded by a 16-inch holophane hemispherical globe. The combination lamp is designed to operate on the 120-volt Edison circuit, and to take a current of 2 amperes, thereby consuming 240 watts. The vapor tube and tungsten lamps are connected in series, the vapor tube taking about 52 volts and the tungsten lamp about 58 volts, the remaining 10 volts being taken up by steadying inductance. An automatic device consisting of an inductance coil with a quick mercury break in vacuum, called a shifter, is placed in the fixture for starting the lamp. Tests of the illumination produced by this installation, made by means of a luminometer, and of the power consumed, are described by Albert J. Marshall, in the April, 1909, issue of the "Transactions of the Illuminating Engineering Society." Mr. Marshall states that the candle power of the tungsten lamp is about 80, and of the Cooper-Hewitt vapor lamp about 200. With a power consumption of 240 watts, this gives an equivalent specific power consumption of 0.86 watt per equivalent candle.

In attempting to improve the color of the mercury vapor lamp there have been developed quite recently in Europe new types, which have been referred to as high pressure mercury vapor lamps. The two most prominent examples of these types are the Bastian lamp, brought out in England, and the quartz tube mercury vapor lamp, brought out first in Germany by Richard Kuch. In the Bastian lamp the arc is produced in a tube of refractory glass about an eighth of an inch in diameter and 9 to 10 inches long, for lamps which are designed to operate at about 110 volts. The intensity of the arc, combined with the small size of the tube, causes the pressure of the mercury vapor to rise to much higher values than with the Cooper-Hewitt form of lamp. This greatly increases the temperature of the mercury vapor, and consequently greatly improves the color of the light, the yellow rays becoming very pronounced. In the lamps due to Kuch there is used a tube of fused quartz in which the arc can be run at a very high temper-

ature. This lamp has a tube about 3 inches long for a pressure of 110 volts. The quartz tube mercury vapor lamp has already become commercial in Germany. Its specific power consumption is quoted as 0.2 watt per mean spherical candle. None of these high-pressure mercury vapor lamps have so far been used in America.

Development of Machinery and of Systems of Distribution.

The first electric lighting of commercial importance was accomplished by means of direct-current carbon open arc lamps, connected in series and supplied from constant current dynamo machines, and by the year 1880 a number of such systems had already been developed and introduced for street lighting. During the following five years street lighting by direct current series arc lamps spread very rapidly both in Europe and in America. The Brush arc dynamo machine developed during this early period has survived to the present day, and is still largely used for series direct-current arc lighting systems. Efforts to introduce series arc lamps for indoor lighting were also made as early as 1878 by Weston, Brush, and by others, but did not meet with favor largely because the arc lamp was too large a light unit and because the color was too different from the accustomed gas flame; the introduction of the incandescent lamp soon afterwards discouraged attempts to use arc lamps for general indoor lighting at this time.

The introduction of the commercially successful incandescent lamp in about 1880 brought about the development of constant-potential dynamo machines and systems of distribution. Direct-current at from 100 to 125 volts pressure was generally used, and the 16-candle power lamp was adopted as the light unit, and in fact constant potential dynamo machines were frequently rated by the number of 16-candle power lamps which they could supply. The Edison and Weston incandescent lamp systems were soon generally used for isolated plants. Edison immediately set to work to develop a complete system of electric lighting which would parallel the gas lighting systems in use. His scheme involved a central station, a system of underground conductors and house wiring supplied from these underground conductors. In the summer of 1880, Mr. Edison installed such a system at Menlo Park, lighting houses and streets with 425 16-candle power lamps, the out-of-door lamps being mounted on poles

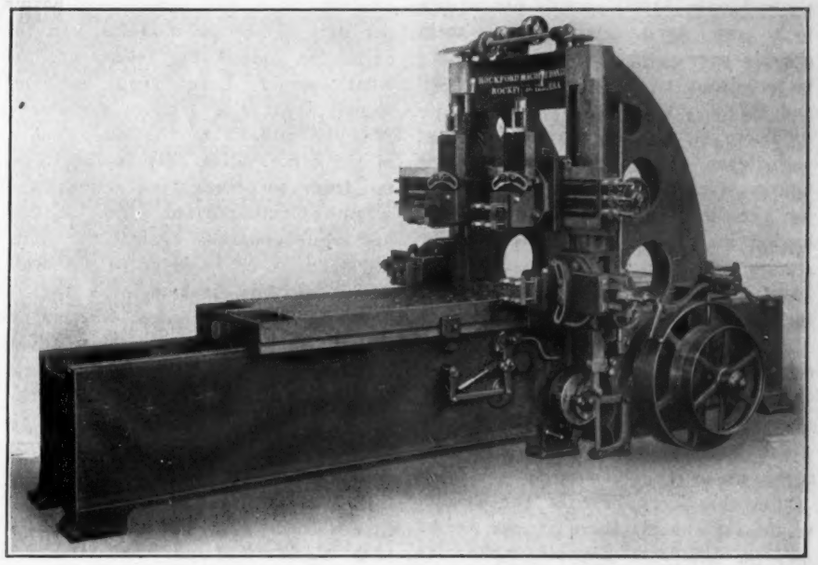
(To be continued.)

THE ROCKFORD HEAVY DUTY PLANER.

The accompanying illustration shows the 32-inch by 32-inch by 8-foot heavy duty planer, manufactured by the Rockford Machine Tool Co., of Rockford, Ill., which has for some years been turning out planers in the smaller sizes and is now developing a full line, its aim being to build a rigid and powerful machine, at the same time maintaining the smooth-running qualities and the ease of operation that have characterized its other tools.

The gearing in the drive is located inside the bed between the bearings. The bearings are long, straight bushings accurately fitted into holes bored directly in the bed castings. Ample means are provided for perfect lubrication. The belt-shifting device is very simple and reverses the table without shock or jar. The heads on cross-rail, also the side heads, have horizontal, vertical and angular feeds. The down feed to the rail heads is 12 inches. The feed friction is of the combination releasing type, and it is claimed will vary the heaviest feeds without slipping and will not run hot. The feeds are changed by the knob shown on the front of friction, a pointer indicating the feed obtained at the different settings. With this device, the feed can be changed for the finishing cut after roughing a piece of work and returned for the next casting and the operator will know exactly what feed he is going to get without making several adjustments, counting the clicks of the ratchet, etc.

The makers say that the different parts of the machine are accurately fitted and are interchangeable, and that side heads can be furnished at any time after machine leaves the factory. Ample means are provided on all bearings for adjustment for wear, taper gibs being used throughout, and all bevel gears, pinions and feed racks are made from open-hearth bar steel.



Heavy Duty Planer, Rockford Machine Tool Works.

VALUE OF TESTS OF STEEL I-BEAMS.

Commenting on the tests of standard and Gray sections of rolled steel I beams carried out by the University of Pennsylvania, and forming the subject of a paper presented at the recent meeting of the American Society for Testing Materials, *Engineering News* says:

"Tests to determine the strength of rolled steel I-beams strike one as almost absurdly unnecessary. Such an everyday element of construction as the I-beam, it would seem, must be thoroughly well known as to strength and behavior; especially since designers have for years past employed the same working stress, 16,000 pounds per square inch, with no suspicion of a doubt as to its conservatism.

"It is a fair matter for surprise, then, that a prominent college laboratory should have thought it worth while to make careful bending tests of I-beams, such as are reported by Prof. Marburg in his paper abstracted elsewhere in this issue. Equally surprising is it that the results are of more than routine interest, and that

in fact they command attention through some unpleasant disappointments in their showings as to the strength of these beams.

"We say unpleasant, because no doubt most of us have always had a silent conviction that an I-beam would develop practically the full strength of its material, i. e., would not fail until its extreme fibers were stressed approximately as high as the ultimate strength of the steel composing the beam. In this connection we have been inclined to think vaguely of something like 55,000 to 62,000 pounds per square inch, and to credit our beams, when stressed to a 16,000-pound fiber-stress, with a safety-factor of 3½ to 4. When we see from Prof. Marburg's tests, however, that 15-inch I-beams averaged only 42,600 pounds per square inch in ultimate strength, while 24-inch I-beams showed only 34,000 pounds per square inch, our tacit assumptions seem gravely over-optimistic, and our safety factor drops to a figure between 2.0 and 2.7!

"There is further reason for concern, even apprehension, in the low figures recorded by Prof. Marburg for the limit of perfectly elastic behavior in these bending tests. The results here are as low as 20,000 to 26,000 pounds square inch for the 15-inch and 24-inch beams, not to speak of the startlingly low average of 11,000 to 12,000 pounds for the 30-inch beams. If we are to figure our loadings on the basis of elastic limit, with a fair safety-margin, where does this bring us as to working stresses?

"On this last phase of the matter, it must be said, there is apt to be quite a difference of opinion, for, as we had occasion to discuss last week, the limit of proportional deformation is not accepted by all engineers as a gage of stresses or as a danger-point of the loading. But, conceding the full argument against attaching importance to the elastic limit, we still must admit that proper material should show strictly proportional deformation up to a much higher point; the material which gives the low results is not normal, or should not be considered normal. In fact, some of the tension tests on strips cut from these test I-beams exhibited very low elastic limit without showing an abnormal yield-point, and it is not easy to escape the conclusion that these particular strips represented poor material, as compared with other strips whose elastic limit was up much nearer the yield-point.

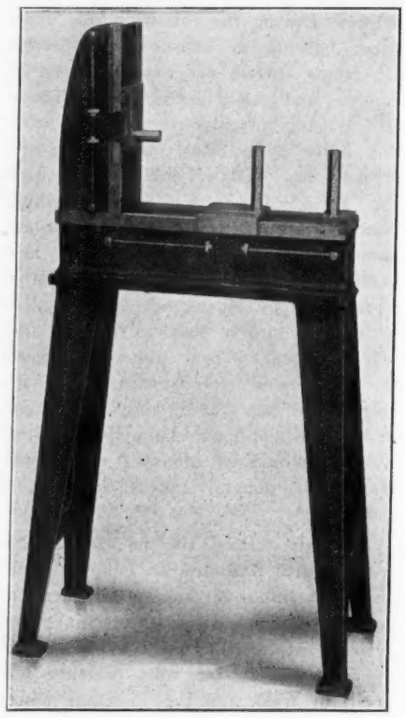
"So important a subject as the strength of I-beams cannot, of course, be considered settled one way or the other by a very limited set of tests, made on beams coming from only one mill (presumably so, though Prof. Marburg does not say where the standard I-beams were rolled). Another mill, with different rolls and different furnace-men, may produce beams of very different strength-characteristics, even if similar in chemical constitution. We should, therefore, like to see fuller experimenting, with beams from different mills, before extending Prof. Marburg's findings to rolled beams generally. In fact these tests make further tests seem quite necessary, if only to reassure.

"But we almost forget the original purpose of Prof. Marburg's experiments, which was to show whether wide-flange beams rolled on the Gray universal beam-mill are more or less efficient than the ordinary I-beams, per unit of section modulus. In this particular, indeed, the results are just what would have been expected, namely, that the section modulus is as fully utilized in the one kind as in the other. Not only is this result far from surprising, but we think it is rather unimportant. For, it does not argue generally against the standard sections or in favor of the wide-flange sections, inasmuch as the reduction of web-thickness, wherein the wide-flange beams get their advantage in section modulus, is not shown to be desirable.

"Be this as it may, however, the comparison between standard and wide-flange beams which these tests furnish is clearly much less important than the showing of low strength in both kinds of beam. We therefore find here, as in many experimental researches, that the important result is a byproduct, while the result sought by the tests turns out to be quite secondary."

A NEW GEAR TESTING DEVICE.

One of those little devices which are the outgrowth of shop necessities, but which are frequently found to be of extended use, is illustrated herewith. It was designed by the Cincinnati-Bickford Tool Co., of Cincinnati, for its own use in testing the running of both spur and bevel gears, and it has since concluded to put it on the market. The gears are mounted on removable studs, which, as will be seen, are carried on blocks fitted in adjustable slides, and which can be moved freely by hand and clamped at any point. The stud in the vertical slide and one of those in the horizontal are fitted with means for securing fine adjustment by means of screws and knurled nuts, together with a vernier scale, whereby correct center distances can be found, the scale readings being graduated to thousandths. With this arrangement the slightest imperfections in the gear teeth make themselves manifest and their causes may be readily analyzed and the proper remedies applied, and gears with a perfect bearing on both face and flank and that will run smoothly and noiselessly will result. The shortest distance between centers on the horizontal slide is 2 inches and the greatest 19½ inches, and the combination with the vertical slide will take miter gears from the smallest that can be made up to 18 inches



BICKFORD GEAR TESTING MACHINE.

diameter, or a combination between 4 inches and 32 inches diameter. The studs furnished with the machine are 1 inch diameter, with a projection of 4 inches, though other dimensions can be supplied if desired. The machine weighs 325 pounds and requires a floor space 16 x 34 inches.

A bulletin issued by the United States geological survey on the production of tin in 1908 shows that the total production of tin in the United States and its territories consisted of a few tons of stream tin sluiced from the gravels of Seward peninsula in Alaska. The country imported 41,267 short tons of pig tin during the year valued at $23,923,560.

NEWS FROM MANY INDUSTRIES

(In order to assist the post offices in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

New Buyers:—

The following manufacturing companies have filed articles of incorporation:

The Long-Histed Motor Co., Kansas City; $10,000; by Louis J. Long, Pearl R. Long, and Roland Histed.

Colonial Gas Machine Co. St. Louis, Mo.; $50,000; by J. Frank Andres, E. C. Vogelsang and others.

Scott-Harris Engine & Transmission Co., Chicago; $100,000; by P. Steele, S. M. Thein, and R. W. Waugh.

Safety Elevator & Machinery Co., Kansas City, Mo.; $60,000; by Harry L. Donnelly, C. A. Fox, John W. Hogan.

The Hayes Rapid Tunnelling & Mining Machine Co., Birmingham, Ala.; by E. W. Hayes, president, and H. F. Shelton, secretary.

The Warner Electric Co. Muncie, Ind., $100,000 by A. L. Johnson, W. E. Hitchcock, R. C. Stone, J. E. Johnson and C. E. Davis.

The Walton Machine Co., Spokane, Wash., $10,000, by Charles Walton, George M. Hull and Carl E. Puckett, all of Spokane.

The Pacific Car & Foundry Co., Portland, Ore.; $1,000,000; by J. W. Riess, S. M. Greene, W. H. Judson, B. W. Buxton, and G. F. Martin.

The Defiance Screw Machine Products Co., Defiance, O.; $25,000; by William Geiger, Sidney Thompson, J. G. Schrag, A. Geiger and B. M. Schrag.

The Grimm Mfg. Co., Buffalo; motors, engines and woodworking machinery; $5,000; by John M. Hull, Edward L. Grimm and Morgan P. Jackson, Buffalo.

The International Signal Co., Wilkinsburg, Pa.; railway signals; $50,000; by Edwin G. Reed, Rufus Reed, Wilkinsburg; Charles R. Buchhet, Pittsburg.

The Keystone Engine & Mfg. Co., Dallastown, Pa.; $100,000; by John J. Taylor, Martin Simon, Dallastown, Pa., and John M. Frere, Wilmington, Del.

The Burroughs Railway Nut Lock Co., Jacksonville, Fla.; $100,000; by O. B. Burroughs, Monticello, Fla.; John Ball, J. A. Burroughs and S. A. Morris, Jacksonville, Fla.

The Edy Alarm Bell & Lock Co., Tacoma, Wash.; builders' hardware and patented articles; $50,000; by G. Dowe Dunbar, F. Edy, Alfred S. Hiller, and Clark H. Speaker.

Stoddard Union Co., Somerville, Mass.; general foundry and machine shop; $25,000; by President William H. Stoddard, 26 Russell road, Somerville; treasurer and clerk, Thomas G. Stoddard, 23 Butler street, Boston.

The Mechanicsburg Foundry & Machine Co., Mechanicsburg, Pa.; $10,000; by A. S. Jacobson, treasurer; A. G. Eberly, S. H. Hauck, J. S. Weaver, J. H. Swartz, R. H. Thomas Jr., A. S. Jacobson and J. P. Shaw, directors, all of Mechanicsburg, Pa.

New Construction:—

The Badger Motor Car Co., Columbus, Wis., has completed plans for a new building, 50 x 150 feet.

A permit has been issued to the Gray Iron Foundry Co., Reading, Pa., to build a galvanizing plant, 26 x 30 feet.

It is reported that the J. I. Case Threshing Machine Co. will erect a three-story brick machine shop at Billings, Mont.

Preparations are being made to rebuild the Central-Hudson car shops, Lyons, N. Y., which were destroyed by fire. The plans have been approved.

Hiram P. Yeager, proprietor of the Penn Boiler Works, Reading, Pa., has purchased a lot, 70 x 100 feet, upon which he proposes to build a boiler factory.

James W. Carr, Richmond, Va., has awarded a contract for the erection of a foundry, two stories, at a cost of $7,000, to James Fox & Son, Richmond.

The Buffalo Brass & Copper Rolling Mill Co. is making extensive additions to its plants in order to add brass rods, sheets and wire to its output.

The Westminister Iron Works, New Westminister, B. C., of which John Reid is proprietor, is shortly to make an addition to its plant and equipment in order to accommodate increased business.

The Enz & Orr Foundry Co., Denver, Col., advises that it is preparing to build a modern foundry which will be one of the largest in the west. Active operations on this improvement have been delayed by the absence of Mr. Enz, who is on the Pacific coast.

Jos. Dyson & Sons, Cleveland, are extending their building to the end of their lot, about 60 feet. They have already put in a new 4,000-pound hammer and are about to install a new boiler and other equipment. They expect to increase their capacity about 30 to 40 per cent.

The Ward Nail Co., Youngstown, O., which recently increased its capital stock from $10,000 to $50,000, has decided to begin business in Youngstown and is looking for a site there on which to establish its factory. The company will make nails by a new machine process invented by D. I. Ward.

The Ohio Forge Co., Cleveland, has within the last three months added another building to its plant, with a new lathe, shaper, die sinker and drill press, and is now about to double its capacity by adding still another building, 40 x 140 feet. Orders have already been placed for a new drop hammer and trimming press.

The Niles & Scott Co., LaPorte, Ind., is adding a one-story building, 60 x 70 feet, to its foundry to be used for molding only. The company is also adding two boilers, 150 horsepower each to those already in use and has purchased two generators for the welding department. No new machinery will be needed.

The Wichita Mfg. Co., Wichita, Kas., has begun work on a foundry which, including the pattern vault, will be 113 by 60 feet, constructed of concrete block with a fireproof lantern roof, with side windows so as to have center light. The foundry will be equipped with a traveling crane, coremaking machines, gas-heated core ovens, and other up to date appliances.

The Birmingham Iron Foundry, Derby, Conn., has specifications out for an addition to its foundry department, 66 x 88 feet. It will be used for machine molding and light work and little new equipment will be required. The fire which occurred in the property bought by the Birmingham company from the Howe Mfg. Co. did about $2,000 damage, fully insured. Nothing had been moved by the Birmingham company into the burned buildings, which are to be repaired and used for a pattern shop and for pattern storage.

General Industrial Notes:—

The A. & J. Mfg. Co., Gadsden, Ala., has begun the manufacture of

steel ranges in addition to the line of stoves which it makes.

The Aultman & Taylor Machinery Co., Mansfield, O., contemplates adding a line of gasoline traction engines to its present output.

Elgin Bros., Anderson, S. C., have established a steel shingle factory in Decatur, Ala. The plant is one of a number which they operate.

The Canton Brass & Machine Co., Canton, O., has bought the plant of the Canton Brass Co., and will carry on the business of brass founding and machine work.

The contract for the necessary iron headgates for the Eugene power ditch has been let to the Frazer Iron Works, Eugene, Oregon, for $1,525.00.

The Coldwell Bros. Co., Seattle, has recently installed four 72-inch by 18-foot high pressure boilers in the plant of the McCormick Lumber Co., McCormick, Wash.

The B. & M. Machine Co., Akron, O., which was recently incorporated, took over an established business, and the incorporation was formed merely for convenience in carrying it on.

The National Lock Co., Rockford, Ill., is building a new structure and expects to occupy it within the month. The new building will nearly double the space now available for the factory.

The sale of the Tidewater Steel Co., Chester, Pa, which was recently postponed, is now set for Sept. 14. A number of persons interested have looked over the plant, and there is a possibility that it may be sold and again operated.

J. T. Sarratt, secretary treasurer of the Buckeye Rolling Mill Co., Steubenville, O., was in Newark, O., recently, making arrangements to put into condition to resume work the rolling mill which the company recently acquired there.

The West Bergen Iron Foundry, Jersey City, N. J., which was recently destroyed by fire, will be rebuilt. The company advises that it is looking for a new site in Jersey City and that building plans will be announced later.

W. E. Leake, one of the receivers of the Woodstock Iron Co., Anniston, Ala., is quoted as expressing the opinion that the company will be out of his hands in 60 days. In another month he thinks the plans for reorganization will be well in hand.

The Cook Lewis Foundry Co., Winston-Salem, N. C., advises that the addition to its foundry, 40 x 40 feet, has been completed and that an additional five-ton cupola has been installed. Everything necessary to equip the new building has been purchased.

The McConnell Engineering & Machinery Co., Tacoma, Wash., has been reorganized. Niven McConnell, formerly president of the concern, has sold out his interest and returned to the east. The name of the company has been changed to the Phoenix Engineering Co.

The Bi-Motor Equipment Co., which has been extensively noticed as a corporation organization to manufacture motors, advises that it is not in the manufacturing business, but is a branch of the S. M. Supplies Co., Boston, Mass., and that it is a jobber and dealer in automobile supplies and accessories.

Plans are under way by the Commonwealth-Edison Co., Chicago, to provide funds for large improvements and extensions of the property. Stock holders, at the annual meeting, Nov. 9, will be asked to approve the recommendation made by the directors that the authorized capitalization be increased from $30,000,000 to $40,000,000.

Kitselman Bros., Muncie, Ind., advise that they are adding to their fence plant a machine shop 60 x 150 feet, two stories. They are also building a wareroom, 150 x 250 feet and adding a building 100 x 250 feet, and another 75 x 150 feet to their wire mill. All of the machinery and equipment for its buildings have been purchased.

The Frank F. Smith Metal Window Hardware Co., Newark, N. J., which was recently incorporated, was formed to take over the business formerly carried on under the name of F. F. Smith. No changes in the business are contemplated. The new officers are Frank F. Smith, president and manager; John C. Eisele, vice president; Charles R. Smith, secretary; and John L. Eisele, treasurer.

The Screw Cutting Co. of America, Philadelphia, manufacturer of power, lead and feed screws, advises that its recent purchase of real estate was made to provide for future expansion. The company makes screws by the milling process upon a machine of its own invention and is enjoying a good business. It is possible that the land it has acquired may be used for building purposes next spring.

The Mitchell-Diggins Iron Co., Cadillac, Mich., has been obliged to reorganize on account of the continued illness of the secretary, Edward Fitzgerald, Grand Rapids, Mich. The new officers are: W. W. Mitchell, president; J. C. Ford, Fruitport, vice president and secretary; Fred A. Diggins, treasurer. Mr. Ford, who has a similar business at Fruitport, will be manager. The policy of the company, which produces malleable, car wheel and strong foundry pig, will remain the same.

A large force of men has been put to work at the Chattanooga plant of the Southern Iron & Steel Co., preparatory to resuming operations there. Nothing has been done at that plant for about two years, except some repair work. Before the plant can resume, furnaces and stoves will have to be cleaned out and relined. When the plant resumes, it is expected to employ about 175 men in addition to those who are engaged in the mines connected with the works.

The North Alabama Rolling Mill Co., Tuscumbia, Ala., has been incorporated to succeed the Sheffield Rolling Mill Co. with an authorized capital stock of $150,000. The plant of the old company is to be overhauled and repaired, with a view to resuming the manufacture of iron products. A force is now at work on the plant, and it is hoped that work can be resumed in November. The officers of the company are: J. W. Worthington, vice president of the Sheffield Cast Iron Pipe & Foundry Co., president; N. P. Lesuer, Nashville, Tenn., vice president; and H. H. Crosby, Memphis, secretary and treasurer.

Fires:—

Three brick buildings at the copper rolling mills of Hendricks Bros., Soho, near Newark, N. J., were destroyed by fire Aug. 13, the loss being estimated at about $150,000.

The plant of the Empire Graphite Co., at Porters Corners, near Saratoga, N. Y., was destroyed by fire Aug. 13. A mill building and several smaller structures were burned, together with six cars containing graphite, but the mine was not damaged. The loss is estimated at $75,000 to $100,000.

No estimate has yet been prepared on the damage to the plant of the American Locomotive Co. by the fire of Aug. 10, which visited its Scranton works and the oil house and round house of the Lackawanna Railroad shops. The principal loss was in the blacksmith shop and the new extension of the smith shop at the locomotive plant, but the total will not be large.

The Atlas Drop Forge Co., Lansing, Mich., was visited recently by fire which destroyed a large part of the plant and will considerably delay the work in hand. Forty thousand dollars had recently been expended on improvements and equipment by the company, and further additions were contemplated when the fire occurred.